IMPERIAL BUREAU OF ANIMAL HEALTH

THE

VETERINARY BULLETIN

Vol. 8.] May, 1938. [No. 5

DISEASES CAUSED BY BACTERIA AND FUNGI.

LITTLE, R. B. (1937). **Bovine Mastitis. I. The Significance of the Dose Factor in the Production of Experimental Mastitis. II. The Production of Mastitis by the Suction of Streptococci into the Duct of the Teat.**—*Cornell Vet.* **27.** 297-308 and 309-316. 5 tables, 2 graphs. [15 refs.]

I. L. presents the results of inoculating varying numbers of typical mastitis streptococci into the udders of first-calf heifers. The organisms were introduced into the teat duct by means of a finely drawn glass rod which had been dipped into a liquid culture. It was found that when a small amount of either pure culture or of a 10^{-1} dilution was introduced into the canal, mastitis developed in 12 quarters of five heifers after a single inoculation. A 10^{-2} dilution (approximately 6,000 organisms) caused mastitis in six quarters after one inoculation and in three quarters after two; the disease was only established in one quarter after four inoculations. It was found that when the smallest inoculation was used (containing about 500 streptococci), 37 inoculations were required to induce infection in seven out of nine quarters, while two remained uninfected after eight and nine inoculations respectively.

II. Experiments designed to set up streptococcal mastitis by applying broth or milk culture to the teats are described. During repeated exposures when a culture was either rubbed over the meatus of the teat of two first-calf heifers or applied by means of rubber bags, streptococci were never detected in the secretion from any quarter. When the teats were compressed and inserted in culture and the pressure released, mastitis developed in five quarters. In a second experiment which included two six-year-old cows and one heifer, it was found that mastitis could be more successfully produced in the older cows. A total of 14 exposures by inserting the teats in culture was required to infect seven quarters, whereas infection was only recognized in one quarter of the heifer after the teats had been "exposed" on 45 different occasions. The author states that the resistance of heifers to infection is probably related to the intact duct and sphincter of the teats.—S. J. E.

I. HARTMANN, G. (1937). Ein Beitrag zur Reinzüchtung von Galtstreptokokken aus bakteriell verunreinigtem Material. **[Isolation of Mastitis Streptococci from Contaminated Material].**—*Wien. tierärztl. Mschr.* **24.** 529.

II. JANONIS, B. (1937). Beitrag zur elektiven Züchtung des Streptococcus agalactiae und der Brucella Bang. **[Selective Culture of *Str.a.* and *Br. abortus*].**—*Ibid.* 529-530.

I. H. further reports on a selective medium for the cultivation of *Str.a.* [See *V. B.* **7.** 311].

II. A short summary of the inhibitory action of 30 substances on strains of mastitis streptococci, micrococci, *Bact. coli*, *Str. lactis* and *Br. abortus*. The most pronounced effect was produced by salts of telluric acid which inhibited strains of *Bact. coli* and micrococci in concentrations which did not interfere with the growth of mastitis streptococci.—S. J. EDWARDS.

I. SOMMER, H. H., & MATSEN, Helene. (1935). **The Relation of Mastitis to Rennet Coagulability and Curd Strength of Milk.**—*J. Dairy. Sci.* **18.** 741-749. 2 figs., 3 tables. [11 refs.]

II. HOLM, G. C., & EVELETH, D. F. (1937). **A Rapid Test for the Detection of Latent and Clinical Mastitis.**—*Vet. Med.* **32.** 20-21. [9 refs.]

III. CASE, C. H. (1937). **Mastitis from the Standpoint of a Practitioner.**—*J. Amer. vet. med. Ass.* **90.** 137-153. 5 figs., 2 tables.

I. Subclinical mastitis causes the milk to have a lower curd strength and to coagulate more slowly with rennet. This was concluded from studies of milk from normal and infected udders, and of milk from normal and infected quarters of the same udder.

II. Increased amounts of catalase in the milk are detected by the addition of a relatively minute amount of hydrogen peroxide, in the presence of an indicator, paraphenylendiamine hydrochloride. The milk remains blue when normal, but turns white if it is from a mastitis udder.

Comparative tests showed it equal in accuracy to the leucocyte count.

III. When streptococcal mastitis exists in only one quarter, the necessity for rejecting all the milk as unfit for human consumption, is considered by the author doubtful. Of 247 cows infected in one quarter (bromthymol test) only 46 (19%) later reacted in another quarter (three months' observation). Also, of 119 cows which had lost one quarter, only seven (5·9%) suffered the loss of a second quarter.—E. W. ASCOLI.

DENNIS, E. W. (1936). **Influence of Specific Antiserum on the Inflammatory Fixation of *Streptococcus hemolyticus*.**—*Proc. Soc. exp. Biol., N.Y.* **35.** 103-105. 1 table. [6 refs.]

The formation of an inflammatory barrier, as induced by various inflammatory irritants, is greatly delayed by the injection of virulent strains of haemolytic streptococci. According to D. this action of haemolytic streptococci is greatly reduced by the presence of polyvalent streptococcus antiserum.—A. ROBERTSON.

GAY, F. P., & CLARK, A. R. (1937). **Stability of Group-specific Characteristics in a Hemolytic Streptococcus.**—*Proc. Soc. exp. Biol., N.Y.* **36.** 175. [Copied *verbatim* from *Bull. Hyg., Lond.* **12.** 724. Signed C. C. OKELL].

Some uncertainty as to the stability of the group A characteristics of haemolytic streptococci has been raised by the experiments of REICH [this *Bulletin* 1935, v. 10, 409] who apparently succeeded in transforming by rabbit passage a human

strain so that it lost its " human " specificity. On subculture, however, the strain reacquired its original characters. In view of these results it was thought worth while to report that a human strain of *Str. pyogenes* (Holman) obtained 19 years ago from a patient with empyema has retained its group A characteristics in spite of the fact that it has been passed at irregular intervals, through the pleural cavity of no less than 187 rabbits. It has acquired a high pathogenicity for rabbits which it did not originally possess. This passaged strain not only conforms in biochemical characters to its original culture but it retains its " human " characteristic of lysing human fibrin but not rabbit fibrin and it precipitates with antiserum of Lancefield's group A.

EHRISMANN, O., & DRAMBURG, K. (1937). Ueber die Verwertung von Aminosäuren durch Streptokokken. [**The Utilization of Amino Acids by Streptococci**].—*Z. Hyg. InfektKr.* **119.** 623-634. [14 refs.] [Copied *verbatim* from *Bull. Hyg., Lond.* **12.** 724-725. Signed C. C. OKELL].

In contrast with the micrococci (Staphylococcus, etc.) the addition of amonoacids to the culture medium does not increase the multiplication of *Streptococcus pyogenes*. The ammonia-splitting effects of *Str. pyogenes* on amino-acids was studied quantitatively in comparison with those of staphylococci, *Bact. coli* and Pfeiffer's bacillus. Of these bacteria *Bact. coli* and staphylococci showed the most active deaminating effects while the effect of *Str. pyogenes* and Pfeiffer's bacillus were much less. While the addition of peptone increased the deaminating properties of streptococcus the addition of amino-acids had no such effect. By means of Sörensen's formol-titration method the utilization of amino-acids by streptococci was followed. The results indicated that although some deamination takes place it is neither of importance as a source of energy nor as a source of N.

STAMATIN, N. (1937). L'immunisation anticharbonneuse au moyen d'une souche de *Bacillus anthracis* acapsulogéne chez le mouton. [**Anti-Anthrax Immunization of Sheep by a Non-Capsulated Strain of** *B.a.*].—*C. R. Soc. Biol. Paris.* **125.** 90-92. [4 refs.]

B.a. grown in defibrinated horse blood produces variants which when plated are seen to have lost their capsules. Such organisms inoculated (subcut.) into rabbits produce a gelatinous oedema and a solid immunity. Eight sheep under 20 months old received subcut. 1 c.c. of a 24 hour broth culture of such a variant, followed six days later by a 5 c.c. dose which resulted in a rise in temperature and a limited oedema. A month after the first injection they received a test dose of a virulent culture of *B.a.* and all proved resistant. A control inoculated with one fifth of the test dose died in 60 hours.—H. H. HOLMAN.

IONESCO-MIHAIESTI, C., SORU, E., & WISSNER, B. (1937). Sur la structure antigénique du *Bacillus anthracis*. [**The Antigenic Structure of** *B. anthracis*].—*C. R. Soc. Biol. Paris.* **125.** 765-767. [5 refs.]

Certain non-dialysable antigenic substances were obtained by extraction of broth cultures of *B.a.* with cold acid or alkali. A brief description is given of their chemical characteristics.—A. ROBERTSON.

I. LOBEL, L. W. M., VAN DER SCHAAF, A., & ROZA, M. (1936). Onderzoekingen met Koch'sche, Dorset'sche en Glover'sche tuberculine en modificaties daarvan. [**Comparison of Koch's, Dorset's and Glover's Tuberculins**].—*Ned.-ind. Bl. Diergeneesk.* **49.** 71-132. 1 fig. on 1 plate, 6 tables. [Numerous refs.] [English and German summaries].

II. LOBEL, L. W. M., VAN DER SCHAAF, A., & ROZA, M. (1936). Typedifferentiatie van tuberkelbacillen afkomstig van rund, buffel en varken in Ned. Oost Indië. **[Typing of Tubercle Bacilli from Cattle, Buffaloes and Pigs in the Dutch East Indies].**—*Ibid.* **48.** 315-345. 2 tables. [Numerous refs.] [English and German summaries].

I. In an extensive series of comparative experiments to find the most reliable method of tuberculin testing, giving the lowest percentage of erroneous results, the authors came to the conclusion that the non-specific reaction with Koch's tuberculin is due to the influence of peptones, glycerin and bacterial extracts. They found that the best results were obtained with the English intradermal test with Glover's tuberculin prepared on synthetic protein-free substrate; the use of the Rautmann syringe is advocated. Apart from the skin thickening, other peculiarities of the swelling should also be noted. The injection should be repeated after 48 hours (in the case of a doubtful reaction 24 hours after the second injection) and in negative reactions the swelling should disappear after another 24 hours. The majority of doubtful reactions point to the existence of tuberculous infection.

II. Twenty-nine strains of tubercle bacilli were typed, 18 newly isolated and the rest from the Buitenzorg laboratory collection. All the 21 cattle strains were of the bovine type, and so were 3 from the water buffalo, though the bacillus seems to alter its character a little in this animal, in that it has only a mild virulence for small laboratory animals and gives a weak initial growth on media. Four out of the five strains from the pig were of the human type, and the danger of infection of man from the pig should be born in mind. Dorset's, Petragnani's and Löwenstein's media, all without glycerin, are the best for the primary cultivation of bovine bacilli; the material should be well emulsified and the media fresh; Fornet's is the best culture tube.—C. BUBBERMAN (SCHIEDAM).

SCHAEFER, W. (1937). Distinction de quatre types sérologiques parmi les bacilles tuberculeux du groupe aviaire. **[Four Serological Types of Avian Tubercle Bacilli].**—*Ann. Inst. Pasteur.* **58.** 388-416. 7 figs., 8 tables. [Num. refs.]

Ninety-three strains of acid-fast organisms, isolated from spontaneous cases of tuberculosis occurring in fowls and g. pigs, were found to possess the cultural characters of the avian type. They were classified by means of antisera prepared from rabbits immunized against different strains of the organisms. C.f. tests were then carried out with these sera after absorption by other strains of tubercle bacilli. Four different serological groups were distinguished and all the 34 strains isolated from fowls fell into two of them, 17 strains in each.

The antisera prepared from organisms of these two groups, after absorption with the organisms of the other avian group, were negative to bovine, human and g. pig strains, and were positive to their own group alone. A bivalent serum, to both of these groups, each absorbed by organisms of the other group, should thus provide a useful diagnostic agent for distinguishing strains of acid fast organisms likely to be virulent to poultry.—H. H. HOLMAN.

SCHWABACHER, Herta, & WILSON, G. S. (1937). **The Inoculation of Minimal Doses of Tubercle Bacilli into Guinea-Pigs, Rabbits and Mice.**—*Tubercle, Lond.* **18.** 442-454. 6 tables. [5 refs.]

From two to ten living mammalian tubercle bacilli will infect the guinea pig by intramuscular inoculation causing a slowly progressive infection. With absolutely minimal doses the lesion at the site of inoculation tends to retrogress, but the disease is progressive in the viscera. Ten to 50 living organisms injected into the trachea or the lung cause a more rapid disease, while in a number of g. pigs intra-

pulmonary inoculation with a bovine strain produced miliary tubercles in the kidney. Rabbits can be given generalized tuberculosis by the intratracheal or intrapulmonary injection of 10-50 living organisms. Mice can be infected by the intravenous inoculation or by inhalation of mammalian bacilli, but no difference in the virulence of human and bovine strains can be detected.

Using avian bacilli a less virulent form of disease is set up in these animals, the lesions showing a tendency to retrogress. The object of this work was an attempt to develop a chronic disease in laboratory animals analogous to that met with in man. This has proved impossible using minimal doses of organisms, as once infection is established a progressive fatal disease is the result.—A. W. TAYLOR.

I. ARENA, A. R., & SCHWARTZ, R. (1936). Résultats comparatifs de la vaccination des chevreaux par le BCG et le vaccin de Friedmann. [**Vaccination of Goats with BCG and Friedmann's Vaccine**].—*C. R. Soc. Biol. Paris.* **123**. 1095-1096.

II. VAN DEINSE, F. (1937). Essais d'immunisation de lapins splénectomisés par des bacilles tuberculeux de type aviaire, tués par chauffage. [**Immunization of Splenectomized Rabbit by Avian Type Tubercle Bacilli Killed by Heat**].—*Ibid.* **124.** 893-895. [2 refs.]

III. BOQUET, A., & LAPORTE, R. (1937). Sort des bacilles d'épreuve dans l'organisme des cobayes tuberculeux surinfectés par voie veineuse. [**The Fate of Bacilli in Tuberculous G. Pigs Superinfected Intravenously**].—*Ibid.* 1156-1158. 3 tables. [1 ref.]

IV. BOQUET, A., & LAPORTE, R. (1937). Essais de vaccination du cobaye contre la tuberculose au moyen de bacilles morts. [**Vaccination of G. Pigs against Tuberculosis with Dead Bacilli**].—*Ibid.* 1159-1161.

V. BOQUET, A., & LAPORTE, R. (1937). Sort des bacilles d'épreuve dans les organes des lapins tuberculeux surinfectés par voie veineuse. [**The Fate of Bacilli in the Organs of Tuberculous Rabbits Superinfected Intravenously**].—*Ibid.* 1267-1269. 2 tables.

I. Goats were infected with a bovine strain of *M. tuberculosis* injected into an eye. Three died of generalized tuberculosis within 267 days and, one, 540 days after injection. Of six goats similarly infected which had received a dose of BCG vaccine three months earlier, two were destroyed owing to extensive eye lesions, and the remaining four were still alive 13 months after the death of the last control. Under similar circumstances a dose of Friedmann's vaccine appeared to give no protection.

II. Three normal rabbits and two which had been splenectomized were immunized by a series of injections of avian strains of *M.t.* killed by heat. After a test dose of the living organism, given intravenously, three months later, the rabbits survived for some four months and P.M. examination revealed no trace of *M.t.* Control rabbits of both types died within 74 days after the injection of the test dose, and TB lesions were present.

III. G. pigs were given subcut. a smooth bovine strain of *M.t.* and 25, 30, or 70 days later received an intravenous inoculation of a rough human strain of this organism. The animals were killed at varying intervals after the second infection. The numbers of colonies growing from selected organs showed that the distribution of the rough type of organism was slight in comparison with the numbers of the smooth strain growing from the same organs, or with the number growing from organs of control animals that had only received the rough strain.

IV. Reviewing their work on the value of dead vaccines for the production of immunity in the g. pig, the authors make the following observations.

The resistance produced in g. pigs is small and can only be shown to exist by using the smallest test dose. Vaccines killed by heat appear preferable to those killed by the addition of formalin. Smooth colonies of a bovine strain are preferable to rough colonies as antigens. Where a single dose is given, intravenous injection has no advantage over subcutaneous injection. The response to the primary injection is augmented but little by further injections at intervals of some weeks. The response to a vaccine is not altered by giving it in lanoline or oil.

V. Following experiments on g. pigs [see III, above], rabbits were infected intradermally with a smooth bovine strain of *M.t.*, and later received an intravenous inoculation with a rough human strain. It was found that in the rabbit the second infection was only present for a short time in the spleen, kidney and lung, and that the original infection after some weeks disappeared from both the spleen and the kidneys, leaving the lungs alone infected.—H. H. HOLMAN.

HOLTH, H. (1937). **Some Investigations on the Virulence and Growth of the B.C.G. Bacillus and Other Tubercle Bacilli.**—*Avh. norske VidenskAkad. I. Mat.-Naturv. Klasse.* No. 5. pp. 41. [In English]. [Abbreviated version appeared in *Norsk VetTidsskr.* **49.** 73-88]. [German summary].

H. describes experiments with two BCG cultures to increase their virulence.

The first strain was subcultured 14 times on inspissated horse blood serum to which 2-4% of concentrated tuberculin had been added. At this stage it produced a very chronic form of tuberculosis (death in 22 months) in a g. pig and further passage, through g. pigs and later rabbits, raised the virulence considerably for both these animals. The cultural characteristics of this strain remained typically bovine.

The second strain was only slightly increased in virulence through subculture in media containing tuberculin and unheated horse serum. H. attempted to increase the virulence of this strain more rapidly by quickly passaging it through g. pigs and rabbits before the defensive action of the hosts had caused any attenuation in its virulence. Material for cultural tests between passages was usually treated with hydrochloric acid and then sown on Petragnani's medium. After a number of passages through a series of g. pigs the strain became very virulent for rabbits and later caused a definite reaction in a calf.

A 19-year-old laboratory bovine strain of tubercle bacilli grown on 5% glycerin broth (beef broth having been replaced by Leibig's meat extract since 1918 for greater uniformity) had gradually lost its virulence for calves although still virulent for g. pigs and rabbits. A few passages through rabbits failed to alter its growth characteristics or virulence.

A human strain of tubercle bacilli with slight virulence for rabbits and treated in a manner similar to the second BCG strain (by culture and passage through rabbits) was greatly enhanced in virulence for rabbits.

H. suggests that human, bovine and avian types of tubercle bacilli should be regarded as a unit in which the three types have become adapted to a particular environment, but whose properties are only temporarily different. This view may explain the so-called intermediate types often found in human TB. He concludes by drawing attention to the difficulties attending the typing of these bacteria, should some mishap occur following the use of a BCG vaccine.—C. V. WATKINS.

BABUDIERI, B. (1937). Essais de révirulentation du B.C.G. et de souches tuberculeuses attenuées moyennant l'association " in vivo " avec des germes acido-résistants non pathogènes. [**Attempt to Make BCG Virulent by Culture with Non-Pathogenic Acid-Fast Bacteria**].—*Boll. Sez. ital. Soc. int. Microbiol.* **9.** 113-116. [In French].

B. describes experiments in g. pigs which showed that the virulence of cultures of BCG or *Mycobacterium tuberculosis* was not increased when they were cultivated with non-pathogenic acid-fast organisms.—F. BLAKEMORE.

MOURIER, P. (1936). 33 Tilfaelde af Lungetuberkulose foraarsaget af Typus bovinus. [**33 Cases of Pulmonary Tuberculosis in Man Caused by Tubercle Bacilli of the Bovine Type**].—*Ugeskr. Laeg.* **98.** 1058-1062. 3 tables. [9 refs.]

Twenty-five of the patients had been in direct contact with cattle and only 3 of the eight remaining patients had no connexion with agricultural work. Thirty patients had drunk raw milk and in 29 cases there was a possibility of transmission of infection from cattle. In one case it seems evident that there was infection from man to man.—H. C. BENDIXEN (COPENHAGEN).

HOWARTH, J. A. (1937). **Paratuberculous Enteritis in Sheep [Johne's Disease].** —*Cornell Vet.* **27.** 223-234. 1 table. [15 refs.]

The symptoms, pathology, and bacteriology of Johne's disease in sheep are described and it is noted that it appears identical with the disease in cattle, except that the characteristic corrugations of the intestine are often absent. Avian tuberculin was found to be a better diagnostic agent than the sample of johnin used by the authors. The disease could be transmitted experimentally from sheep to cattle by drenching the latter with a saline suspension of intestinal scrapings. —P. S. WATTS.

STEVENSON, J. C., & HILBERT, K. F. (1937). **Canine Pasteurellosis.**—*N. Amer. Vet.* **18.** No. 8. 37-38.

An outbreak of pasteurellosis is considered to have infected rats, rabbits and chickens and to have spread to a kennel of dogs. Infected dogs showed highly inflamed tonsils, vomition and diarrhoea, with terminal pneumonia. Swabs from the tonsils revealed the presence of an organism of the pasteurella group, a culture of which quickly caused death when administered to a dog, a fowl and a rabbit. —H. H. HOLMAN.

I. KAIRIES, A. (1936). Die Pasteurellen-Influenza des Frettchens als Modell zur Erklährung der Hemophilus-Influenza des Menschen. [**Influenza due to Pasteurella in Ferrets and Influenza due to Haemophilus in Man**].—*Zlb. Bakt. I. (Orig.).* **137.** 9-44. 10 figs. on 2 plates, 7 tables, 2 graphs. [Numerous refs.]

II. FINDEISEN, H. (1936). Studien zur systematischen Stellung des Bacteriums der spontanen Frettcheninfluenza (Bacterium influenzae putoriorum multiforme Kairies). [**The Systematic Position of the Bacillus of Ferret Influenza** (*Bacterium influenzae putoriorium multiforme* Kairies)].—*Ibid.* 256-266. 4 figs., 5 tables. [Numerous refs.]

III. SMITH, W. (1937). **The Influenza Problem.**—*St Mary's Hosp. Gaz.* **43.** 112-120. 3 tables. [Numerous refs.]

I. One of the main objects of this work is to point out the importance of some form of activation which will stimulate the bacteria, normally present in or on an animal's tissues, in the production of pathological effects. The work was done largely with ferrets and an influenza-like disease. Doubt is apparently cast on the work of LAIDLAW and his colleagues in connection with influenza. The conclusions reached are that the pasteurella influenza of ferrets is similar to *Haemophilus* influenza in man, in that both are due to some form of activation which

stimulates the action of pasteurella and haemoglobinophilic bacteria respectively. [It is unfortunate that the word influenza is used loosely and, although Pfeiffer's influenza bacillus was at one time regarded as the causative organism of human influenza, the current opinion now held is that it may play a role in some cases of fulminating influenzal pneumonia, but that the influenza virus is the actual cause.

II. The so-called ferret influenza bacillus is considered to be a pasteurella. This conclusion is based on the examination of seven strains all of which reacted in a similar manner serologically. Strains were pathogenic for mice and showed an association with pasteurella from birds, calves and pigs by limited cross protection and by agglutination and complement-fixation tests.

III. A lecture given by S. reviews the recent work done by him and his colleagues LAIDLAW and ANDREWES on the aetiology of influenza.

Briefly the evidence in favour of the view that the virus is the causal agent which infects ferrets and has been adapted to mice and egg membranes and tissue culture is as follows :– (1) the virus has been isolated from about 46 of 66 cases of influenza, but not from cases of common cold, measles or from normal human beings ; (2) similar viruses have been isolated from influenza patients all over the world ; (3) by the time human beings have reached adult life from 70 to 100% of the population yield sera capable of neutralizing the virus ; (4) in ferrets and mice and in natural human cases antibodies appear soon after infection and increase during convalescence ; (5) there are records of infection of man with influenza virus from infected ferrets, and (6) freshly isolated strains of Pfeiffer's influenza bacillus failed to produce influenza in human volunteers sprayed with living cultures.—R. LOVELL.

MIDDENDORF, F. (1936). Ueber das Vorkommen von Keimen der Enteritidisgruppe in den Darmlymphknoten geschlachteler Kälber. [*S. enteritidis* **in Intestinal Lymph Nodes of Slaughtered Calves**].—*Inaug. Diss., Hanover.* pp. 36. 2 tables. [Numerous refs.]

M. examined a single mesenteric lymph node from each of 300 healthy calves for the presence of *S. enteritidis*. From a normal lymph node of one calf only could the organism be recovered although coliform organisms and micrococci were present in 86 cases.—S. J. EDWARDS.

SUHACI, I., & ISOPESCU, I. (1937). Sur une epizootie d'avortement infectieux des brebis produite par Salmonella abortus ovis en Roumanie. [**Paratyphoid Abortion of Ewes in Rumania**].—*Arhiva vet.* **29.** No. 2. 17-27. [Numerous refs.] [In French : English and German summaries].

S.a.o. is reported for the first time as a cause of epidemic abortion in ewes in Rumania. The organism was identified on morphological, cultural and serological grounds. A formolized whole culture vaccine was prepared from the strain isolated and the whole flock was given two injections of 1 c.c. and 2 c.c. respectively with an 8-day interval between the doses. The abortions then ceased. [No controls were kept].—P. S. WATTS.

I. VAN ROEKEL, H., & BULLIS, K. L. (1937). **Salmonella Infections in Chickens.** —*J. Amer. vet. med. Ass.* **91.** 48-58. 5 tables. [3 refs.]

II. HOFFMANN, H. A., & EDWARDS, P. R. (1937). **The Spontaneous Transmission of IV Variants of Salmonella aertrycke from Pigeons to Rabbits.**—*Amer. J. Hyg.* **26.** 135-137. [7 refs.]

I. The control and eradication of *S. pullorum* infection are the chief subjects

discussed in this article. The cumulative effect of annual macroscopic aggl. tests on the incidence of the disease is shown. Where the owner has conscientiously co-operated, short interval retesting (four to six weeks) has eradicated the disease usually within three tests. Reactors were removed regularly.

The significance of infection with other salmonella and their effect on the serum titre to *S. pullorum* are discussed. The most important of these is *S. gallinarum*, and this organism was isolated from birds in two flocks which showed reactors to *S. pullorum*. There were also reactors in a flock, the chickens of which had had acute paratyphoid and from which a salmonella organism was isolated.

II. The authors in investigating the causes of death in rabbits bred on a farm, isolated a paratyphoid organism. It was obtained from lesions of colitis, and from metritis in pregnant animals. In close contact with the rabbits were some pigeons kept in an unsanitary loft. The same organism was isolated from an enlarged scapulo-humeral joint of a pigeon. The organism was found to produce acid and gas in glucose, maltose, mannite, arabinose, xylose, inosite and dulcite. Lactose and sucrose were unchanged. Hydrogen sulphide was produced, and acid formed in tartrate agar. Serologically the organism was a diphasic salmonella of group B (Kaufmann-White schema). Its specific and non-specific phases were found to be identical with those of *S. typhi-murium* (*Bact. aertrycke*). While its " O " antigen belonged to group B it was incapable of exhausting *S. typhi-murium* antiserum of " O " agglutinins, although it could exhaust *S. abortus-equi* antiserum of its " O " agglutinins. *S. typhi-murium* antiserum absorbed with *S. abortus-equi* no longer contained " O " agglutinins for this organism. Therefore, it must contain factor IV, but not factor V of group B. The authors give the antigenic formula of this organism as IV, XII : i : 1, 2, 3.

This well recognized stable variant of *S. typhi-murium* has frequently been found in pigeons and occasionally in man. In many of the human patients the ingestion of infected pigeon eggs was incriminated, and in consequence the authors consider that the infection was spread from the pigeons to the rabbits.—D. L. H.

DEDIÉ, K. (1937). Dauerausscheider von Bacterium enteritidis Gärtner bei Silberfüchsen und sonstige Fuchskrankheiten. [**Continuous Excretion of *S. enteritidis* by Silver Foxes**].—*Inaug. Diss., Hanover.* pp. 40. 3 tables. [19 refs.]

According to D., *S.e.* infection is the most common bacterial disease of silver fox cubs. In order to investigate its origin a search was made in tissues of 125 silver foxes and in 395 samples of silver fox faeces. Only once was the organism recovered from each source and for this reason D. concludes that infection does not arise from a carrier animal, but through the consumption of infected meat.
—S. J. EDWARDS.

BURKE-GAFFNEY. (1936). **Memorandum on the Brucella Group.**—*Conf. vet. Res. Brit. E. Afr. 1936.* pp. 114-119.

This includes information on the habitat and pathogenicity, clinical forms, epidemiology, classification, diagnosis, treatment and public health aspects of the organisms of the brucella group and the infections they cause.—J. C. WALLACE.

WAGENER, K. (1937). Die Bedeutung des Bacteriums abortus Bang für die Entstehung des seuchenhaften Verkalbens. [**The Significance of *Brucella abortus* in relation to the Existence of Contagious Abortion**].—*Tierärztl. Rdsch.* **43.** 383-386. [7 refs.]

W., replying at some length to several critics of his earlier papers on the

aetiology of contagious abortion, particularly HAUPT and WITTE, emphasizes his view that *Br. abortus* " shows a certain ubiquity " and that, whilst he in no way denies its infective character, he believes that this is not of first importance and that contagious abortion should be looked upon more as a " biological breeding" problem [see *V.B.* **8.** 136].—A. W. STABLEFORTH.

I. DOYLE, T. M., & BECKETT, F. (1936). **The Isolation of *Brucella Abortus* from the Milk of Cows with Negative Blood Reactions to the Agglutination Test.**—*J. Comp. Path.* **49.** 320-327. 1 table. [18 refs.]

II. FITCH, C. P., & BISHOP, Lucille M. (1937). **Brucella Abortus in Raw Market Milk.**—*Cornell Vet.* **27.** 37-41. 1 table. [15 refs.]

I. After reviewing concisely the literature regarding the isolation of *Br.a.* from the milk of cows whose blood serum did not contain specific agglutinins in the amounts usually accepted as indicating infection, D. and B. report the examination of a series of milk samples from 309 non-reacting cows in 17 infected herds by means of g. pig inoculations and whey agglutination tests. Composite samples from each cow were centrifuged and 2 c.c. of mixed cream and deposit inoculated intramuscularly. *Br.a.* was isolated from two cows. A sample from another cow had a whey titre of 1 : 100, whilst two g. pigs inoculated with the milk of a fourth cow had blood titres of 1 : 25 and <1 : 200 respectively, indicating that both of these cows may also have been excreting *Br.a.*

In the 17 commercial dairy herds of 684 cows which were tested, the average herd infection was 35%.

II. The authors tested milk from 67 dairies selling raw milk to a municipality. From each sample whey was obtained for aggl. tests, and 2-4 c.c. of gravity cream inoculated (intraperit.) into 4 g. pigs. These were killed 4-5 weeks later; aggl. tests were made with blood-serum and cultures from the spleen. *Br.a.* was isolated from the cream from 17 (25·4%) of the 67 dairies. Agglutinins at a dilution of 1 : 25 or 1 : 50 were demonstrated by g. pig inoculation in the milk of 8 of the 17 dairies whose milk was positive, but in none of the others. [No indication of the opacity or sensitivity of the test suspension is given]. All the strains proved to be of the bovine variety.

112 strains of *Br.a.* from cattle were also typed on dye plates; 4 were of the porcine type and 108 of the bovine type.—A. W. STABLEFORTH.

ENGSTRÖM, K. A. (1937). Försök med " Abo 7 " mot smittsam kastning hos nötkreatur. [**Experiments with "Abo 7" – a Proprietary, Non-Specific "Vaccine" – against Bovine Brucellosis**].—*Svensk VetTidskr.* **42.** 210-213.

Ninety-six animals were treated in a herd in which 41 per cent. showed a positive reaction to *Brucella abortus*. Fifty-one animals received two successive inoculations, but 38 received only one because pregnancy had occurred. During the time of observation a number of animals were sold and of the remainder 12 aborted. After one year the percentage of reacting animals was 47. The treatment was not found to have any effect. It seemed as though the after-births were discarded more easily than before.—H. C. BENDIXEN (COPENHAGEN).

DEEM, A. W. (1937). *Brucella abortus* **in Horses.**—*J. infect. Dis.* **61.** 21-25. 3 tables. [5 refs.]

Blood aggl. tests were made on 189 horses attending the clinic attached to the College of Veterinary Medicine, Ohio, during the year 1935-36. Of 34 horses suffering from fistulous withers, or poll-evil, or both, 3 reacted at 1 : 50, 3 at 1 : 100, 9 at 1 : 200 and 13 at 1 : 500. Of the remaining 155 animals, 18 reacted

at 1 : 50, 7 at 1 : 100, 1 at 1 : 200, and 3 at 1 : 500 and 6 were negative. Among 103 artillery horses tested 8 reacted at 1 : 50 and 2 at 1 : 100.

Material was obtained from 15 cases of bursitis preceding fistulous withers that had not been opened when brought to the clinic, and *Br.a.* was obtained from nine of these. In each case growth only took place in the presence of CO_2; in one case other bacteria were also present.—H. H. HOLMAN.

STEFFENS, M. (1937). Ueber die Bruzellose des Schweines. (Zugleich ein Beitrag zur Intradermal-Probe als Diagnostikum). [**Porcine Brucellosis**].—*Dtsch. tierärztl. Wschr.* **45.** 355-357. [14 refs.]

S. reports details of an outbreak of abortion in a large herd of swine which was only recognized as due to brucella after some months. It was not until three herd tests had been carried out that positive reactions appeared. At this time, evidence of brucella infection was also obtained from g. pigs inoculated with suspect aborted material. Details are given of the course of the outbreak, and symptoms and lesions in sows and boars. Many of the latter were affected and played a large part in spread. Young unserved females from infected mothers often showed infection for the first time at puberty. The disease was eradicated in 9 months by stopping all service and taking strict hygienic precautions, together with herd blood tests at intervals of from one to two months, and separation of reactors and non-reactors.

A comparison of the relative value of an intradermal test made in the ear with carbolized or formolized antigen and the aggl. test showed that by the former only about one half as many infections were diagnosed as by the latter. In two positive animals systemic reactions occurred, besides local oedematous swelling.

The author discusses the loss that may occur and the importance of an attempt by the veterinary attendant to persuade the owner to take strict precautions and voluntarily to cease all sales for a time.—A. W. STABLEFORTH.

I. BARBARY, F. (1935). La prophylaxie de la fièvre ondulante, basée sur la collaboration étroite, indispensable, des Services d'Hygiène et des Services vétérinaires départementaux. [**Prophylaxis of Undulant Fever, Based on Definite Collaboration between the Veterinary and Medical Services**]. - *Bull. Acad. Med. Paris.* **114.** 40-47.

II. HORNING, B. G. (1935). **Outbreak of Undulant Fever Due to Brucella suis.** —*J. Amer. med. Ass.* **105.** 1978-1979. 3 tables. [5 refs.]

I. The author shows how collaboration between the medical and veterinary services has reduced the incidence of undulant fever in the rural districts of the Maritime Alps. He discusses the need for action against mosquitoes and other biting insects as possible vectors of the disease. He considers the intradermal test to be reliable for the detection of the disease in man and animals. When bacteriological examinations were made of infected cattle in this area, the organism isolated was always found to be *Br. melitensis* and it is assumed that this is the prevalent infection in the cattle, which are affected almost as frequently as sheep and goats.

II. The author describes the first outbreak of undulant fever in Connecticut. During 1934 to 1935, 14 clinical cases were reported in an institution for elderly persons out of a total of 386 inmates and staff: three cases were fatal.

The porcine strain of *Br. abortus* was obtained from an abscess in one patient and by blood cultures from two fatal cases. Of 36 cows, 1 bull and 32 pigs kept by the institution, 2 cows and 9 pigs gave positive reactions for brucella infection and 1 cow and 7 pigs reacted doubtfully.

The author considers that the drinking of raw milk from these infected cows was the cause of the outbreak.—C. V. WATKINS.

SINGER-BROOKS, Charlotte H. (1937). **Brucella Infection in White Mice.**—*J. infect. Dis.* **60.** 265-278. 2 figs., 3 tables. [9 refs.]

The pathogenicity of *Br. abortus* of the porcine type for mice was investigated. Doses of 300 million organisms (intraperit.) killed mice within four days, but mice receiving a dose of 30 million or less lived and maintained or increased their weight, the females did not abort and the young were born healthily. Lesions at autopsy included small areas of necrosis in the liver and slight enlargement of the spleen. Seventy-two mice that had received two or four doses of a heat-killed vaccine became acutely ill some hours after receiving a test dose of 400 million organisms, but all recovered in 16 hours and afterwards appeared healthy; they harboured the organism for some months. Unvaccinated control mice died.

—H. H. HOLMAN.

A. KRANEVELD, F. C., & DJAENOEDIN, R. (1936). Anäerobe bacillen en de door hen veroorzaakte infecties bij de huisdieren in Nederlandsch-Indie. XVIII. Overzicht over het onderzoek van sinds 1932 ontvangen materialen van osteomyelitis bacillosa bubalorum. XX. Onderzoek naar het voorkomen van micro-organismen in het beenmerg van gezonde buffels, in verband met de pathogenese der osteomyelitis bacillosa. [**Anaerobic Infections of Domestic Animals in the Dutch East Indies. XVIII. Review of Cases of Oesteomyelitis bacillosa bubalorum since 1932. XX. The Causal Organism of Osteomyelitis bacillosa bubalorum in the Bone-Marrow of Healthy Buffaloes**].—*Ned.-ind. Bl. Diergeneesk.* **48.** 255-263 and 290-295. [6 refs.] [English and German summaries].

B. HUBER, F. L., & KRANEVELD, F. C. (1936). Anäerobe bacillen en de door hen veroorzaakte infecties bij de huisdieren in Nederlandsch-Indie. XIX. Boutvuurfiltraat-boutvuurformolvaccin. [**Anaerobic Infections of Domestic Animals in the Dutch East Indies. XIX. Blackleg Filtrate and Formol Vaccine**].—*Ibid.* 263-270. 2 tables. [3 refs.] [English and German summaries]. [See also *V.B.* **6.** 741].

A. XVIII. Out of 11 cases of bacillary osteomyelitis of the water-buffalo sent to the Veterinary Institute at Buitenzorg during 1932, the presence of the typical anaerobic organism, related to *Bacillus gigas* Zeissler, could be demonstrated microscopically in eight cases, in five of them in pure culture. The disease was characterized by necrosis of bone-marrow and cortical bone, formation of a false bone casing (proliferative periostitis), intramuscular abscesses, arthritis and secondary bone fractures. There were no indications that chronic anaemia was an aetiological predisposing factor.

XX. With a view to investigating the possibility that the causal organism of bacillary osteomyelitis of the water-buffalo is present in an inactive state in the bone-marrow of healthy buffaloes the authors examined with negative results 25 bone-marrow samples from affected districts as well as 100 samples from non-affected ones.

B. In a laboratory experiment with 240 g. pigs, which were first fed with blackleg culture and afterwards injected with either filtrate or formolized blackleg vaccine, the authors could not affirm the findings of LOURENS, according to whom an injection of blackleg filtrate is dangerous since it may lead to activation of blackleg organisms existent in the intestinal tract.—M. J. J. H. (ROTTERDAM).

DE BLIECK, L., & JANSEN, J. (1937). Onderzoek naar de waarde van het boutvuurformolvaccin bij kalveren. [**Vaccination of Calves against Blackleg by Formol Vaccine**].—*Tijdschr. Diergeneesk.* **64.** 513-519. 1 table. [6 refs.] [English, French and German summaries].

An account of uncontrolled vaccinations with a formol treated whole culture vaccine. The results were satisfactory [*V. B.* **5.** 798].—A. W. Möller.

Goyal, R. K. (1937). Étude microbiologique, expérimentale et immunologique de quelques streptothricées. [**Study of Some Streptothrices**].—*Ann. Inst. Pasteur.* **59.** 94-128. 5 figs., 6 tables. [Numerous refs.]

Eleven strains isolated in different parts of Europe have been examined. In isolating the organisms sulphuric acid or acetic acid were used, but the latter is much more toxic. Spores have no greater resistance to heat than filaments. Different strains can be neither identified nor classified by the pH of the medium used, great variation being shown by different strains at different stages of incubation. Their pathogenicity for g. pigs was slight or non-existent, and could not be enhanced by animal passage, although two strains after repeated inoculation caused rather more intense lesions than the others. Serological tests would appear to indicate that there is one antigen common to the streptothrix – mycobacterium-corynebacterium group.—A. Wilson Taylor.

Dold, H., Wizemann, E., & Kleinen, C. (1937). Ueber antibakterielle Hemmungsstoffe (Inhibine) und antibakterielle Wandlungsstoffe (Mutine) in der frischen, rohen, unter sterilen Kautelen entnommenen Milch (Kuhmilch und Frauenmilch). [**The Bacteria-Inhibiting Substance (Inhibine) and Antibacterial Transforming Substance (Mutine) in Milk**].—*Z. Hyg. InfektKr.* **119.** 525-538. 6 tables. [11 refs.]

A report of the examination of milk for bactericidal or bacteriostatic substance. Its presence in the fresh milk of women and cows was demonstrated by incorporating 50% of fresh milk or of boiled milk in agar medium. Such medium was sown with a variety of organisms, including many human pathogens, and the growths on fresh milk agar and boiled milk agar were compared. In all cases growth was much more prolific on the boiled milk agar and in the case of certain organisms no growth at all occurred when fresh milk was present. It is of interest that the bacteriostatic substance remained active as long as 48 hours when incorporated in agar. [Other workers are agreed that this substance ceases to function in normal milk which has been stored more than 8-10 hours]. In the present experiments the factor was destroyed by a temperature of 80°-83°C. The presence in milk of another more heat-resistant factor is claimed which stimulates morphological variation in bacteria. [The bacteriostatic factor in cows' milk has been carefully studied by Jones and co-workers, and a series of reports appeared in the *J. exp. Med.* of 1928 and onwards – see *V. B.* **4.** 257. The fraction was separated from milk, concentrated and stored, and attempts were made to study its chemical nature].—E. J. Pullinger.

Hirsch, W. (1937). **The Agglutinability by Trypaflavine of *B. typhosus* and its Relation to Vi Antigen.**—*J. Path. Bact.* **44.** 349-355. 4 tables. [15 refs.]

In using the trypaflavine test for "roughness" H. found that smooth cultures of *Salmonella typhi* (*B. typhosus*) were agglutinated by trypaflavine, and that the reaction was connected with the presence of Vi antigen. Saline washings from sterile agar containing agar in a colloidal form were also flocculated by trypaflavine. This colloidal agar present in suspensions of washed-off agar affects trypaflavine agglutination of rough and smooth strains of *S.t.* differently.

Trypaflavine agglutination cannot be used to differentiate rough and smooth strains of *S.t.* unless they are devoid of Vi antigen.—D. L. Hughes.

I. STEINFELDT, G. (1936). Beitrag zum Nachweis der Schwefelwasserstoffbildung bei verschiedenen Bakterienarten. [**H_2S Production by Bacteria**]. —*Inaug. Diss., Berlin.* pp. 24. 6 tables. [Numerous refs.]

II. O'MEARA, R. A. Q., & MACSWEEN, J. C. (1937). **The Influence of Copper in Peptones on the Growth of Certain Pathogens in Peptone Broth.**—*J. Path. Bact.* **44.** 225-234. 7 tables. [10 refs.]

III. PRATT, E. L. (1937). **The Growth of Microörganisms on Media Exposed to Ultra-Violet Radiations.**—*J. Bact.* **32.** 613-619. 2 tables. [14 refs.]

IV. WEDUM, A. G., & GOLDEN, Bernice L. (1937). **The Carbohydrate Gradient of Certain Microorganisms.**—*J. infect. Dis.* **60.** 94-98. 2 tables. [Num. refs.]

I. A study of the ability of various bacteria to produce H_2S in a medium consisting of peptone water containing 1% cystin. Examinations were made periodically, beginning after six hours' incubation, and continuing for four days; in this way the earliest stage at which H_2S was produced by various organisms was found. [Data recorded emphasize the unreliability of the H_2S test as a criterion for typing the various species and varieties of brucella].

II. Some varieties of commercial peptone contain small traces of copper (up to 1·6 mg.% of free Cu) whilst other makes such as Difco are practically copper-free. Most pathogenic bacteria, with the outstanding exception of the *Bacterium* and *Salmonella* genera, are very sensitive to the presence of free copper, their development being noticeably inhibited even by such small traces as 0·0625 mg.%. The removal of free copper from commercial peptone would ensure a greater uniformity of behaviour of bacteria in culture media. The harmful effect of free copper is neutralized by the addition of serum.

III. Irradiation of Difco agar and certain other media with ultra-violet light rendered the medium less suitable for the development of the spores of *Bacillus subtilis*, and to a lesser extent for certain vegetative forms of bacteria. Irradiation of 1% glucose did not alter its nutritive value, except to move the pH towards greater acidity. (The degree of irradiation was exposure for 6 hours at 50 ergs per sq. mm. per second with light 90% of which was of wave-length 2537Å).

IV. The work reported serves to stress the inadequacy of the indicator method of testing whether an organism can utilize a certain carbohydrate. 800 cultures from the American Type Culture Collection were examined for ability to utilize carbohydrates, the results being tested by indicator and chemical methods. A number of strains of fungi and bacteria utilized all the carbohydrate present, yet produced no or only very little acid. One particularly interesting case was that of a certain *Leptothrix* which was able to utilize fructose but not dextrose. [Usually monosaccharides are most easily fermented].—E. J. PULLINGER.

HADLEY, P. (1937). **Further Advances in the Study of Microbic Dissociation.** *J. infect. Dis.* **60.** 129-192. [Numerous refs.]

A highly speculative review of past researches on the study of microbial dissociation. The three colony phase names smooth ("S"), rough ("R") and intermediate ("SR") are now in common use. Owing to the lack of definite criteria to indicate what precise phase an organism is in, or whether it is a pure phase culture or not, much confusion has arisen in the literature. Furthermore it has recently been realized that many organisms may produce a mucoid colony which might perhaps be considered as a "super-smooth" phase. The modern conception of colonial variation should, therefore, include mucoid —> "S" —> "SR" —> "R" and possibly other intermediate variations.

With certain outstanding exceptions, it is generally a fact that colony morphology can be correlated with certain other morphological, physiological, cultural and

biochemical attributes including antigenic constitution. It is stressed that the various phases are interconvertible, sometimes readily and sometimes with difficulty, and the sequence of variation is discussed from the point of view of the possible existence of definite developmental cycles. Whilst conclusive evidence on this point is lacking, the author favours the opinion that developmental cycles do control bacterial variation. In support he mentions that the mucoid —>" R " variation has never been reported, but always the mucoid —>" S "—>" R ".

Generally the smooth phase of bacteria is virulent or toxigenic, whilst in some, but not all cases, the mucoid phase shows an even greater virulence. Non-virulent mucoid forms have, however, been noted. Among streptococci the " matt " form (*i.e.*, " R " in the above terminology) shows greatest virulence, whereas among tubercle bacilli (avian and mammalian types) the smooth form is usually more virulent. [This rather surprising conclusion is upheld by assuming that workers who have reported the high virulence of rough strains of mammalian tubercle bacilli were not working with pure " R " culture phases].

The relationship between dissociation and immunological problems is discussed and it is noted that, whereas the " S " phase is generally associated with high immunizing ability, the Vi (virulence) antigen is not necessarily lost during " S "—>" R " dissociation. The biological significance of variation is discussed. [Readers particularly interested are referred to the original. Many will not agree with the fundamental assumption around which the whole review is built, namely that all study of variation should be based upon colony morphology and that biochemical, antigenic and other types of variation must be fitted into some conception centred around sequence of colony-appearance].—E. J. PULLINGER.

WILLIAMS, F. T. (1936). **Attempts to Increase the Heat Resistance of Bacterial Spores.**—*J. Bact.* **32.** 589-597. 1 fig. [16 refs.]

Using single cell cultures of from 5-30 days old, an attempt was made to increase by artificial selection the heat resistance of the spores of seven—*Bacillus subtilis*, *B. graveolens*, *B. mycoides*, *Clostridium pasteurianum*, *Cl. acetobutylicum*, *Cl. butylicum* and *Cl. sporogenes*. Only in the case of *B. mycoides* was any noteworthy increase observed, which was from 10-25 minutes at 100°C. Wide variations occurred in the heat resistance, but contrary to results obtained by MAGOON, not always in the same direction. No correlation could be observed between the age of spores and their heat resistance.—M. BURKE.

DISEASES CAUSED BY PROTOZOAN PARASITES.

FLETCHER, J. M. (1936). **Some Cases of Tick-Borne Disease in Cattle.**—*Vet. Rec.* **48.** 858-859.

F. reports five cases in cattle, diagnosed on epidemiological grounds as " louping ill ".—R. FISHER.

CHEVRET, SOULIÉ, BORDE, & POURSINES, S. (1937). La trypanosome du cheval de Syrie. [**Equine Trypanosomiasis in Syria**].—*Rev. vét. milit.* **21.** 95-114 and 141-162. 6 figs., 3 tables. [Numerous refs.]

An outbreak of trypanosomiasis of horses in Syria is described. In 1935, during an inspection in the Sanjak area, four cavalry horses were found to be emaciated, icteric, and suffering from fever and haemoglobinuria. On microscopic examination of the blood, trypanosomes were found in three of the animals. The region in which the infection was believed to have been contracted is one of intense

humidity, and examination of horses of another squadron which had been located in that area revealed three further cases. Close enquiry among local inhabitants showed that the disease was unknown to them. In 1935 biting insects had been very abundant. Symptoms of emaciation and loss of appetite had been observed in the affected animals for a month or two prior to discovery of the trypanosomes. Febrile attacks were found to occur at intervals, the temperature rising to 40°C. or even 41°C. The icterus and haemoglobinuria may continue after the paroxysm. Anaemia and depression, and petechiae of the conjunctiva are observed. Attacks last three or four days and some improvement follows, but they recur at intervals of 2 to 16 days. Oedema appears in dependent parts.

Dogs, white rats, g. pigs and rabbits were infected by inoculation; the results of infection in these animals are described. Splenectomy in dogs, performed after inoculation, hastened death. Performed before inoculation, attacks were equally severe but with longer intervals, and fever and density of blood infection no longer coincided. Microscopical examination showed alterations in the spleen, liver, kidneys, heart and nervous system.

The trypanosome is morphologically similar to *T. evansi* and *T. brucei* and measurements are given. Motility is comparatively feeble and agglutination with serum of infected animals occurs but is not considered specific.

On account of the absence of glossina the Syrian trypanosome is considered probably to be a type of *T. evansi*, but the existence of surra (*T. evansi* infection) has already been described in Palestine and Irak. The disease had either been introduced or was a virulent outbreak of a latent infection.

In most cases when symptoms strongly indicate the disease, the parasite can be found on microscopical examination of the blood. If negative, blood should be inoculated into a rat or dog. The formel-gel and sublimate tests give uncertain results. In treatment, "gonacrine" alone or with novarsenobenzol or "acetylarsan" produced some improvement, but the parasites were still found in the blood. Good results were obtained with "naganol" (0·01 g. per kg.), with "trypoxyl" (0·01 g. per kg.), sodium antimony tartrate (0·004 g. per kg.) or "anthiomaline" (0·003 g. per kg.), and details are given of a number of cases in which these drugs were used successfully.—S. J. Gilbert.

I. Zuccarini, J. A. (1936). Conservación *in vitro* de la capacidad infestante experimental del *Tripanosoma cruzi* Chagas, 1909. [**Infectibility of Blood *in vitro* Taken from Cases of Chagas' Disease**].—*Folia biol., B. Aires.* Nos. 66-69. pp. 285-287. [Copied *verbatim* from *Trop. Dis. Bull.* **34.** 938. Signed H. H. S.]

II. Nino, F. L. (1937). Contribución al estudio de la distribución geográfica de la enfermedad de Chagas comparada con la de los triatomas vectores del "Schizotrypanum Cruzi", en la República Argentina. [**The Geographical Distribution of Chagas' Disease and that of Triatoma Species Compared**].—*Prensa méd. argent.* **24.** 813-823. [Copied *verbatim* from *Trop. Dis. Bull.* **34.** 936. Signed H. H. S.]

III. Ruge, H., & Röper, E. (1937). VI. Der heutige Stand der Chagaskrankheit mit besonderer Berücksichtigung der Epidemiologie und der Uebertragungsversuche auf Säugetiere. [**The Present Position of Chagas' Disease with Special Reference to the Epidemiology and Transmission Experiments to Mammals**].—*Ergebn. Hyg. Bakt.* **19.** 352-463. 20 figs. [Numerous refs.] [Copied *verbatim* from *Trop. Dis. Bull.* **345.** 935-936. Signed W. Y.]

I. Samples of blood were taken with a Bayer's Venule from two patients

exhibiting Romanã's symptom of unilaterial conjunctivitis and local adenitis and were found capable of infecting young white rats after 2 and 4 days respectively. Experimental tests were then made to determine the length of time during which samples would remain capable of transmitting infection. A dog was infected and blood from the carotid was taken with a Venule 3a (the blood being found to contain sparse trypanosomes) and kept for varying periods up to 10 days at room temperature, and white rats a few days old were injected intraperitoneally with 0·1 c.c. Five animals were inoculated after 2, 4, 6, 8 and 10 days; all became infected, but the period of incubation lengthened from 5 days in those receiving the injection after 2 days, to 16 in those injected after 10 days' interval. The blood sample was received in citrate solution in the Venule.

II. This paper cannot be abstracted as the evidence is presented mainly in the form of protocols giving the State and district where Chagas' disease in acute or chronic form has been reported, the year, the recorder and the index of infection when known. It is, consequently, a presentation of the distribution of American trypanosomiasis. The distribution of the vectors is also given and some indication of the parasitic index, of animals domesticated and wild, *i.e.*, the proportions found parasitized. The insects are found fairly generally distributed between 22° and 41° south latitude, but the degree of their infection lessens to the south and east of this area; the distribution and prevalence of disease and insect infestation correspond.

III. In their introduction the authors point out that Chagas' disease has a peculiar history in that the transmitter and the causal parasite were discovered before cases of the disease. Even to-day it provides many puzzles for the investigator. Why, for example, does one find in the Brazilian provinces – and especially in that of Minas Geraes – so much goitre, cretinism and Chagas' disease, that Chagas himself suggested the parasite was actually responsible for the goitre and cretinism in addition to the other signs of the disease? This is a matter which has been much discussed. The variation in the severity of the disease in different places is very striking, and it is equally little understood why the transmitter, which is a coscopolitan insect of the tropics and subtropics, does not spread the disease in other places than South and Central America. A further interesting question is why the drugs which are active in African sleeping sickness and in kala azar are quite inactive in this disease. In view of such considerations the authors consider that even though Chagas' disease may have quite a subsidiary significance in comparison with other infections, it is worth while to present in the German literature a short account of the disease, stressing especially its immuno-biological, pathological and epidemiological aspects.

In the section dealing with the clinical course of the disease, the authors deal with the acute form and with the chronic form in the conventional manner. After discussing the methods of diagnosis, they pass to a description of the causal organism and its development in the insect transmitter. The geographical distribution of the disease is dealt with very fully, and this is followed by an account of the natural infections which have been discovered in various animals, *e.g.*, dogs, cats, armadillos, opossums, bats, monkeys and rats.

The next section is concerned with the very important problem of the relationship of goitre, cretinism and Chagas' disease. As the result of their reflections, the authors conclude that it is at the present time impossible to reach a definite conclusion on this matter. The equally important question of the possible relationship of *T. cruzi* infection to the chronic heart disease, which appears to be so common in many parts of South America, is apparently ignored.

The remaining sections of the work deal with such matters as pathology,

experimental infections in animals and culture of the parasite; and at the end of the book is an enormous list of references. The article is undoubtedly a useful summary of the present position of knowledge of this very interesting infection.

GUO, K. D. (1937). Die gegenseitige Beeinflussung zwischen pathogenen Trypanosomen und Rekurrensspirochäten bei Mischinfektionen. [**The Antagonistic Action Between Pathogenic Trypanosomes and Relapsing Fever Spirochaetes in Mixed Infections**].—*Zlb. Bakt. I.* (*Orig.*). **139.** 113-125. [15 refs.] [Copied *verbatim* from *Trop. Dis. Bull.* **34.** 934-935. Signed W. Y.]

Having given a summary of the work of previous investigators on this subject, the author passes to an account of his own work. He used 3 trypanosome strains, *viz.* :– *T. congolense*, which had been kept at Hamburg since 1925, and also *T. rhodesiense* and *T. brucei*; and 4 spirochaete strains, *viz.* :– *Sp. obermeieri* kept in mice since 1935, *Sp. hispanica* obtained from *Ornithodorus maroccanus* in 1935, *Sp. berbera* kept in Hamburg since 1927, and *Sp. duttoni* obtained from *Ornithodorus moubata* in 1907 and since maintained in mice.

In order to ascertain the influence of the spirochaetal infections on the trypanosomal infections, sometimes the parasites were injected simultaneously, and sometimes the spirochaetes were inoculated first, and when the blood was positive the trypanosomes were injected. In view of REICHENOW's (1934) observation that *T. congolense* was influenced by human serum *in vivo*, the author has administered human serum to animals with mixed infections of spirochaetes and trypanosomes in order to ascertain whether the trypanosomes thus influenced exhibited to any appreciable extent a special reaction to the spirochaete infection.

From his experiments, which are given in detail, the author concludes that in mice which are first infected with one of the above spirochaetes and then with *T. congolense* there is a definite prolongation of the trypanosomal infection. *T. congolense* infections both in rats and mice were influenced by human serum.

It was established that the weaker and the more frequent the paroxysms of the spirochaetal infections, the more definite the inhibitory action on the trypanosomal infection. The author believes that the specific spirochaete antibody acts not only against the spirochaete but also non-specifically against trypanosomes.

NICOLAU, S., & PÉRARD, C. (1936). Étude histo-physio-pathologique de l'oeil et du système nerveux dans la leishmaniose généralisée du chien. [**Pathology of the Eye and the Nervous System in Generalized Canine Leishmaniasis**]. —*Ann. Inst. Pasteur.* **57.** 463-486. 19 figs. [Numerous refs.] [See also *V. B.* **7.** 417].

The authors describe the histology of the eye and nervous system of a dog which died of generalized leishmaniasis one year after experimental infection. Although the dog was blind only slight opacity of the lens could be determined during life. Mononuclear leucocytes, some of which were parasitized, infiltrated the cornea, sclerotic, iris and the ciliary processes of the eye. Extra-cellular parasites were found in most of these situations. No parasites were found in the parenchymatous tissue of the brain, but rare ones occurred in the meninges. The spinal dura mater was extensively parasitized, but the cord and its inner meninges were intact. Spinal ganglia and peripheral nerves showed slight lesions with scanty parasites.

These findings explain the nervous symptoms sometimes seen in canine leishmaniasis.—C. V. WATKINS.

CIFERRI, R., REDAELLI, P., & SCATIZZI, Ida. (1936). Unità etiologica della malattia di Seeber (granuloma da *Rhinosporidium Seeberi*) accertata con lo studio di materiali originali. [**Classification of Rhinosporidia**].—*Boll. Soc. med. chir. Pavia.* **14.** 723-746. 4 figs. on 1 plate. [Numerous refs.] [Abst. from abst. in *Boll. Sez. ital. Soc. int. Microbiol.* **9.** 79].

The authors were unable to find any difference between *R.s.* and *R. equi* after mycological and histopathological studies. They, therefore, propose the following name and synonymy :– *Rhinosporidium Seeberi* (Wernicke 1903), Seeber 1912, emend. Asworth 1923 ; *Coccidiodes* sp. Seeber and Wernicke 1900 ; *Coccidium Seeberia* (Wernicke) Belou 1903 ; *Rhinosporidium Kinealyi* Minchin and Fantam 1905 ; *Rhinosporidium Seeberi* (Wernicke) Seeber 1912 ; *Rhinosporidium equi* Zschoschke, 1913.

YAKIMOFF, V. L. (1936). Coccidios dos animaes domesticos do Brasil. [**Coccidia of Domestic Animals in Brazil**].—*Arch. Inst. biol. Def. agric. anim., S. Paulo.* **7.** 167-187. 14 tables. [Numerous refs.] [English summary].

In the faeces of 49 bovines, 49 sheep, 53 pigs and 53 fowls sent from São Paulo to Leningrad, Y. found coccidiosis to the following extent :– in cattle—*Eimeria smithi* 16·3 %, *E. ellipsoidalis* 2 %, *E. bukidnonensis* 2 %, mixed infection *E.s.* and *E.e.* 4 %—total 24·4 % ; in sheep—*E. arloingi* 4 %, *E. ninae-kohl-yakimovi* 5 %, *E. galouzoi* 1 %, mixed infection with *E.a.* and *E.n.-k.-y.* 6 %, *E.a.* and *E.g.* 1 %, *E.n.-k.-y.* and *E.g.* 3 %—total 48·9 % ; in pigs—*E. debliecki* 14 %, *E. perminuta* 2 %, mixed infection with *E.d.*, *E.p.* and *E. scabra* 17 %, *E.s.* and *E.d.* 7 % and *E.d.* and *E.p.* 5 %—total 84·9 % ; in fowls—*E. tenella* 3 %, *E. maxima* 3 %, mixed infection with *E.t.*, *E.m.* 3 %, and *E.t.*, *E.m.* and *E. mitis* 1 %—total 19·8 %.—S. T.

YAKIMOFF, W. L., MATSCHOULSKY, S. N., & SPARTANSKY, O. A. (1937). Weitere Untersuchungen über Kokzidiose bei den Rentieren. [**Coccidiosis in Reindeer**].—*Berl. tierärztl. Wschr.* May 21st. 322. 1 table. [2 refs.]

Five out of 27 reindeer were found to harbour coccidia. *Eimeria tarandina*, *E. polaris*, an *Isospora* and a few unidentified oocysts were observed. Descriptions based on size, shape, nature of wall, spores and sporozoites etc. are given for each species. The unidentified oocysts were deformed but their length is given as 24μ. [The authors wisely refrain from allotting the oocysts to any definite species].
—C. HORTON-SMITH.

ALLA, C. (1937). Moyens de combattre les piroplasmoses bovines en Algérie. [**Control of Bovine Piroplasmosis in Algeria**].—*Thesis, Lyons.* pp. 65. [Numerous refs.]

The various organisms causing tick fevers of cattle in Algeria are reviewed and the methods employed in that country to combat these diseases are discussed. A number of personal observations on the use of " gonacrine " and " V.45 " are described. In general premunition is stated to be useful in combating *Babesia bigemina*, *B. berbera*, *Anaplasma marginale* and *Theileria dispar*, whilst medicinal treatment is of value only in the case of *B. bigemina* and *B. berbera*.—S. J. GILBERT.

I. LESTOQUARD, F., & DONATIEN, A. (1937). Sur deux parasites des hématies du mouton et du boeuf d'un genre nouveau : Erythrocytozoon n.g. [*Erythrocytozoon*, **a New Genus of Blood Parasite of Sheep and Cattle**].—*Bull. Soc. Path. exot.* **30.** 454-459. 12 figs. [10 refs.]

II. DONATIEN, A., & LESTOQUARD, F. (1937). Transmission naturelle d'*Eperythrozoon wenyoni* par une tique du genre *Hyalomma*. [**Natural Transmission of *Eperythrozoon wenyoni* by *Hyalomma* Ticks**].—*Ibid.* 459-460. [2 refs.]

I. The authors describe protozoan blood parasites of sheep and cattle which they place within the group *Anaplasma-Bartonella-Grahamella-Eperythrozoon*, and to which they give the new generic name of *Erythrocytozoon* (*E. ovis* and *E. bovis*). Twelve figures illustrate these two species as compared with *A. marginale*, *E. wenyoni* and a mixed infection of *A. marginale* and *E. bovis*.

E. ovis has been found in Algerian, Iranian and French sheep. The parasites are either in the erythrocytes or free in the plasma, but free forms are much less numerous than in infections by the S. African strain of *E. ovis*. They occur as minute coccoid forms ranging from invisibility to $0{\cdot}3\mu$ and from one to 30 parasites may be present in a single red blood cell. Ring forms are occasionally seen. Binary fission is probable because diplococcal forms were often noticed. They are never arranged either in groups or in chain formation, but appear to be distributed in an unorganized manner. From a few to 80% of the R.B.C. were parasitized. When stained by May-Grünwald-Giemsa the parasites are coloured pale rose pink and there is an absence of a halo (*cf. Anaplasma*). They do not appear to be pathogenic as pure infections and neither temperature reaction nor change of blood formula occurs. In *E. wenyoni* infection the reverse is the case. Natural infection in Algeria is often intercurrent with *A. ovis*.

In cattle similar parasites were found and these had precisely the same characters as the sheep species.

The authors briefly describe the chief differential characters of the anaplasma, bartonella, grahamella and erythrocytozoon groups.

II. D. and L. have previously reported the joint transmission of *Theileria dispar* and *Rickettsia bovis* to Algerian cattle by species of *Hyalomma* derived from Iran. They now report the transmission of *Th. dispar* and *E. wenyoni* together by similar ticks from the same source and, not having found the latter parasites in Algerian cattle before, they conclude that the Iranian ticks were the vestors. The ticks had been fed during their larval and nymph stages on Iranian cattle affected with theileriasis and were then sent to Algeria where a group of seven female ticks and four male ticks were fed on each of two bulls. The bulls showed definite symptoms of theileriasis within 14 days and the parasites were seen, and about seven days later *E. wenyoni* parasites were noted in R.B.C. Inoculation of the blood of one of these bulls through a series of cattle gave rise to moderate parasitism by *E. wenyoni* in a few cases.—C. V. Watkins.

Bornand, M. (1937). Contribution à l'étude de la spirochétiase aviaire à Sp. anserina (gallinarum) et observations sur la biologie d'Argas persicus Fischer et d'Argas reflexus Fabr. [**Fowl Spirochaetosis and the Biology of Argas Species**].—*Schweiz. Arch. Tierheilk.* **79.** 174-181. [13 refs.] [In French].

B. briefly reviews the literature upon spirochaetosis of birds and the methods of transmission and cultural requirements of *Spirochaeta anserina*. He obtained two lots of infected *Argas persicus* from Tunis, storing them in winter at 30° to 35°C. and in summer at room temperature. Two cockerels were infected (one fatally) by the first group of ticks, but a few of the same ticks were placed on a pigeon and a canary with negative results. Some of the second batch of *A.p.* were non-infective for three cockerels and a pullet, but 22 of them proved infective for a pullet. Seventeen of these 22 ticks were non-infective for another pullet 8 months later. Two groups of 10 *A. reflexus* fed on an infected cockerel were non-infective for 2 pullets, 2 and 4 weeks later respectively. Survival times for *A.p.* at different temperatures were as follows: 6 out of 10 for 1 year at 2°C.;

3 out of 3 for 1 hour at –5°C.; 2 out of 3 for 1 hour at –10°C.; 0 out of 3 for 30 mins. at –25°C.; 0 out of 3 for 1 hour at 50°C. and 0 out of 3 for 5 mins. at 60°C.; but death in 15 mins. at 60°C. or in 5 mins at 65° or 70°C. Similar results were obtained for *A.r.*

A.r. is normally a parasite of pigeons but, especially in the larval stages, readily fed on poultry in these experiments. Cultivation of *S. anserina* was found to be easiest in the medium of Marchoux and Chorine.—C. V. WATKINS.

DISEASES CAUSED BY VIRUSES.

BARNARD, J. E. (1937). **Foot-and-Mouth Disease and Vesicular Stomatitis. A Comparative Microscopical Study.**—*Proc. roy. Soc.* Ser. B. **124.** 107-113. 28 figs. on 3 plates. [4 refs.]

The technique for the preparation of photomicrographs of F. & M. disease and vesicular stomatitis virus particles is described in detail. Ultra-violet light is employed and comparative photographs have been obtained by both transmitted light and dark-ground illumination. The virus preparations studied have been obtained from g. pig lesions without any preliminary treatment of the material; in this way damage to the virus particles and epithelial cells is avoided.

A comparison of the photomicrographs of the two viruses shows a definite difference in size, which is in agreement with the results obtained by filtration experiments. The F. & M. disease virus particle is generally rod-like, although spherical forms are seen. Large forms of both organisms are observed and transitional stages of varying size may occur. The largest forms are seen in the older lesions where they are found as free bodies in the vesicle lymph.—E. C. HULSE.

BALOZET, L. (1937). Inoculation du virus de l'anémie infectieuse des équidés à d'autres espèces. [**The Susceptibility of Various Species of Animals to the Virus of Equine Infectious Anaemia**].—*C. R. Soc. Biol. Paris.* **124.** 1150-1153. [See also *V. B.* **8.** 153].

Attempts to infect rabbits, g. pigs, rats, fowls and monkeys with the virus of E.I.A. were unsuccessful. In sheep no clinical symptoms were shown, but after several injections, virus was detected in the blood up to eight days after the last injection.—H. H. HOLMAN.

GAUBERT. (1936). La peste équine à Dakar en 1930 et 1932. [**African Horse-Sickness at Dakar in 1930 and 1932**].—*Rev. vét., Toulouse.* **88.** 607-616. 2 figs.

This is a clinical record of two outbreaks of horse sickness met with in Senegal in 1930 and 1932. All the cases occurred in imported animals. In 1930, only symptomatic treatment could be given and of 14 cases (1 horse and 13 mules), 8 succumbed to the disease. In the 1932 outbreak the serum of animals which had survived the 1930 outbreak was injected in large doses and of 11 mules affected only 4 deaths occurred. G. concludes that serum of animals recovered a year previously possesses valuable therapeutic properties. [This is contrary to South African experience – see HENNING. (1932). Animal Diseases in South Africa **2.** 532. South Africa: Central News Agency. – who states that the serum of recovered cases is valueless, but that hyperimmune serum is of some use]. The symptoms and P.M. findings in these two outbreaks are given together with a few short notes on the control of the disease. G. reports that an indigenous horse inoculated with blood taken from two mules at the height of infection failed to show any reaction to the inoculation.—C. DAVENPORT.

EMOTO, O., KONDO, S., & WATANABE, M. (1936). **On the Epidemic of Equine Encephalitis which Occurred in the Year 1935 in Japan.**—*J. Jap. Soc. vet. Sci.* **15.** 41-63 of pt. 2. 8 figs. on 4 plates, 4 tables, 3 charts. [18 refs.] [In English.]

This is an account of a peculiar disease of the central nervous system of horses seen in Japan in 1935. 832 cases in all were reported with a mortality rate of 33%. Young animals were the most susceptible. The disease had a seasonal incidence commencing with the advent of warm humid conditions. It disappeared with the onset of colder weather. Symptoms are given in detail. Two clinical types were recognized, namely the encephalic and the spinal ataxic.

The histological findings in the central and peripheral nervous systems are dealt with at length. A considerable portion of the article is devoted to an account of inoculation experiments carried out to elucidate the causal agent of the condition and the transmissibility of the disease from horse to horse and to the small laboratory animals.

Results were mostly negative, but the authors consider that they did transmit the disease from two of their cases to one horse and some rabbits, though only a transient nervous derangement occurred in the latter.

The authors find the disease to have been an equine encephalitis of epidemic form, but whether it was related to Borna disease and American encephalomyelitis was uncertain.—C. DAVENPORT.

REMLINGER, P., & BAILLY, J. (1937). Contribution à l'étude du virus de la maladie d'Aujeszky. (Troisième mémoire). [**Virus of Aujeszky's Disease. III**].—*Ann. Inst. Pasteur.* **59.** 5-38. 1 table. [7 refs.]

Inoculation experiments have shown that the virus of Aujesky's disease may be irregularly distributed throughout the brain and spinal cord. Natural infection in all probability is by the ingestion of contaminated material, but it may, in a very small percentage of cases, be transmitted by biting as in rabies; virus has been demonstrated in washed salivary glands and in saliva. The introduction of virus into the ear also results in infection, as does inoculation (intraven. or intramusc.). A curious feature of the disease is that the majority of the affected animals die during the night. Of 796 animals, only 207 (28%) died during the day. No satisfactory explanation can be given for this pnenomenon. In contradistinction to rabies, it is exceedingly difficult to produce a satisfactory vaccine against this disease; the authors' experiments have shown that virus treated with sodium ricinoleate has no immunizing value. Pseudorabies virus maintains its virulence over a very long period, more than four years if stored in glycerin at 6°C. Only one type of virus is known, the Hungarian, the French and the American (mad itch) strains being apparently identical.—A. WILSON TAYLOR.

BRITISH EAST AFRICA. (1936). **Memorandum on Rabies by the Deputy Director of Laboratory Services, Tanganyika Territory.**—*Conf. vet. Res. Brit. E. Afr. 1936.* pp. 96-97.

The incidence of rabies in Tanganyika is obscure, but the presence of the disease in contiguous territories to the north and south makes penetration possible. It occurs in Kenya, where the jackal is a common vector.—J. C. WALLACE.

I. ANON. (1937). Renseignements transmis par le gouvernement du Reich sur l'état de la rage pendant l'année 1936. [**Rabies in Germany in 1936**]. —*Bull. Off. internat. Epiz.* **14.** 356-358. 1 graph.

II. ANON. (1937). La rage en Tchécoslovaquie. Année 1936. [**Rabies in Czechoslovakia in 1936**].—*Ibid.* 359. 1 table. [1 ref.]

III. ANON. (1937). La rage en Yougoslavie. Année 1936. [**Rabies in Yugoslavia in 1936**].—*Ibid.* 360-361. 1 table. [1 ref.]

I. In 1936 there was a slight increase in rabies in Prussia, where 62 districts were affected. A graph shows the monthly incidence.

II. This consists of a table showing the incidence of rabies in the four provinces, the number and species of rabid animals, and the deaths from rabies. Rabies was diagnosed in 224 dogs and 38 other animals.

III. There was an increase in rabies in Yugoslavia in 1936, in the mountainous districts where wolves played a part. Over 27,000 cattle in the province of Vardar were attacked by wolves, which are thought to number 10,000. Rabies was diagnosed in 904 dogs, 34 cats, 14 equines, 144 cattle, 50 sheep, 11 goats and 71 pigs.
—J. E.

ARANICKI, M. (1937). O rezultatima postinfekcionalnog cepljenja domacih životinja u Jugoslaviji antirabičnom vakcinom po Hemptu 1926-1936 g. [**Results of Post-Infection Vaccine Treatment of Domestic Animals for Rabies in Yugoslavia**].—*Vet. Arhiv.* **7.** 461-472. 6 tables. [7 refs.] [German summary].

An account is given of the results obtained with Hempt's post-infection vaccine for rabies made in the Institute of Hygiene at Novi Sad, Yugoslavia. From 1926 to 1933 domestic animals which had been bitten were treated on two successive days with inoculations of a dead ether vaccine, and on the third day with an inoculation of a live lipo-vaccine. Altogether 2,905 domestic animals of all kinds were thus treated, and only 47 of them died of rabies. In 1934 the live vaccine was abandoned, so that after that time the treatment consisted of inoculations of a dead ether vaccine only, which was given daily for three days, in appropriate doses. Up to the end of 1936, 2,910 animals were treated, 20 of which died of rabies.—B. OSWALD (SPLIT).

I. ROCHAIX, A. (1936). Sur la transmission transplacentaire de la mère au foetus du virus rabique fixe, chez la lapine. [**Placental Transmission of Rabies Virus in the Rabbit**].—*Bull. Soc. Sci. vét. Lyon.* **39.** 114-119. [7 refs.]

II. LÉPINE, F., & SAUTTER, V. (1936). Aptitude negrigéne du virus fixe de Sassari. [**Production of Negri Bodies in Infection with the Sassari Fixed Rabies Virus**].—*C. R. Soc. Biol. Paris.* **122.** 542-544. 2 figs. [4 refs.]

III. REMLINGER, P., & BAILLY, J. (1937). La glycémie des animaux atteints de rage. [**Glycaemia of Animals Infected with Rabies**].—*Ibid.* **125.** 708-711. 4 tables.

IV. DODERO, J. (1937). Dessication et conservation en glycérine des moelles rabiques (virus fixe de hanoi). [**Desiccation and Preservation in Glycerin of Spinal Cords Infected with Fixed Rabies Virus**].—*Bull. Soc. Path. exot.* **30.** 348-352. 2 tables. [7 refs.]

I. Pregnant rabbits were inoculated with fixed virus at different periods of gestation. After the death of the mother, the cerebral tissue of the foetuses was inoculated into g. pigs. Virus was found to have been transmitted to the foetus only in the later stages of gestation—after the 23rd day.

II. This strain has been maintained at Sassari for 36 years, during which time it has been passaged more than 1,700 times without any modification of its virulence. Mice are readily killed by subcutaneous inoculation and Negri bodies

are demonstrable in rabbits after intracerebral inoculation; the virus closely resembles the street rabies virus. A further peculiarity of this strain is that it was derived from the Pasteur fixed virus and that its virulence was greatly increased after the 26th passage. In earlier passages rabbits were killed in 9-10 days, but this period has been reduced to 5-6 days; also the virus is now over ten times more virulent for mice by subcutaneous inoculation.

III. The experimental infection of dogs and rabbits with fixed rabies virus produces a slight hyperglycaemia in the later stages of the disease. Similar results have been obtained with street virus. Glycosuria is frequently observed in rabies, but this bears no constant relationship to the hyperglycaemia. In several of the experimental animals, glycosuria was absent when there was a pronounced hyperglycaemia and *vice versa*. It would appear that hyperglycaemia and glycosuria are independent physiological processes.

IV. After 2,030 passages of this strain through rabbits, the action of desiccation and preservation of rabbit spinal cords in glycerin has been studied.

Rabbit cords were desiccated over caustic potash at 20°-22°C. for 1-6 days; it was found that 16 retained their virulence after six days' drying. Portions of these dried cords were preserved in glycerin at 8°-10°C. for a week; those which had been dried for four, five and six days showed a virulence of 25, 8 and 0% respectively. After 15 days in contact with glycerin, almost all the cords dried for 2-6 days had lost their virulence. For practical vaccination it is suggested that the cords dried for 1-4 days should remain in contact with the glycerin not longer than 10 days so as to ensure the production of an effective vaccine.—E. C. Hulse.

Schoen, R. (1937). Virus rabique et néoplasmes. [**Rabies Virus and Neoplasms**]. —*C. R. Soc. Biol. Paris.* **125.** 939-941. [2 refs.]

A strain of street rabies virus has been passaged through rabbits simultaneously with the Brown-Pearce epithelioma. Rabies may be transmitted to rabbits by the intracerebral inoculation of the infected tumour; Negri bodies are not always observed in the tumour tissue. After several intracerebral passages, a cerebral tumour was found in which Negri bodies were demonstrable in the tumour cells.—E. C. Hulse.

Sedlar, I. (1937). Patološko anatomske i patološko histološke promjene bubrega kod štenecáka. [**Kidney Changes in Dog Distemper**].—*Vet. Arhiv.* **7.** 491-503. 1 table. [20 refs.] [German summary].

It is still an open question whether distemper may or may not be responsible for the kidney changes so often met with in dogs. S. made histological examinations of kidneys obtained from 33 dogs affected with distemper; 21 had died, the remainder having been killed when in a hopeless condition. In 28 cases a reversible, and thus reparable degeneration of the tubular epithelium alone was found; in the remaining five cases there was a chronic inflammation, not considered to be due to the disease. S., however, agrees with those who consider that distemper is not responsible for kidney changes in dogs.—B. Oswald (Split).

Rossi, P. (1937). La broncho-pneumonie infectieuse ou influenza des bovidés ne serait-elle pas due à un virus filtrant? [**Is Infectious Bovine Broncho-Pneumonia or Influenza due to a Filtrable Virus?**].—*C. R. Soc. Biol. Paris.* **125.** 104-105.

The instillation into the nostrils of two cattle of filtered nasal discharge and material from the respiratory organs of bovines suffering from infectious broncho-pneumonia or cattle influenza appeared to be capable of causing pyrexia and,

sometimes, inflammation of the trachea and larynx. [R. admits that definite proof of the assertion is lacking]. Subcutaneous injection of the filtrate was followed by no pathological change. Of 52 naturally affected cattle examined, no organisms could be found in the blood of 50. Pulmonary exudate from 10 cases contained no visible organisms and that from 4 contained pasteurella.—G. WILLIAMSON.

I. FRANCIS, T., Jr., & MAGILL, T. P. (1937). **The Antibody Response of Human Subjects Vaccinated with the Virus of Human Influenza.**—*J. exp. Med.* **65.** 251-259. 6 figs. [9 refs.]

II. MAGILL, T. P., & FRANCIS, T., Jr. (1937). **The Action of Immune Serum on Human Influenza Virus in vitro.**—*Ibid.* 861-872. 6 tables. [18 refs.]

III. HARE, R. (1937). **Recent Advances in the Study of Influenza.**—*Canad. publ. Hlth J.* **28.** 157-165. 1 table. [Numerous refs.]

I. Influenza virus grown in tissue culture for 160 generations was centrifuged and the supernatant fluid inoculated (subcut. or intraderm.) in varying doses at weekly intervals. Antibodies rapidly developed in the serum, or increased if already present, and persisted for at least five months.

II. It has usually been held that immune serum and living virus do not combine *in vitro*, and also that, when serum is added to chick embryo in Tyrode solution before inoculation with virus, there is no growth. The serum, therefore, can prevent multiplication by acting on the virus itself, on the cells, or on virus only in the presence of cells. The authors find, however, that cells incubated for 24 hours in the presence of high titre serum and then washed are capable of supporting growth. Virus can also survive in cells if added before immune serum. Further, after 30 minutes' incubation with virus, immune serum is capable of so neutralizing it that it is incapable of infecting mice or of multiplying in the presence of cells.

III. In the autumn of 1918, during the world-wide epidemic of influenza in man, a new disease appeared in swine in Iowa. It is extremely contagious and appears every autumn with a death rate of 1-4%. The causation was worked out by Shope – the virus of swine influenza together with *Haemophilus influenzae suis*. The assumption is that human virus was transmitted to swine in 1918 and since that date has survived in a slightly modified form as the main cause of swine influenza.—A. WILSON TAYLOR.

LAZARUS, A. S., EDDIE, B., & MEYER, K. F. (1937). **Ultrafiltration of Psittacosis Virus.**—*Proc. Soc. exp. Biol., N.Y.* **36.** 437-438. [7 refs.]

The authors have confirmed the size of the psittacosis virus, as determined by previous workers who used filtration through gradocol membranes, and microscopic and photomicrographic measurements.

Infected chorio-allantoic membrane from chick eggs was mixed with 2 c.c. of diluent (hormone broth pH 7·3 or buffered water pH 7·3), then centrifuged and the supernatant fluid diluted 1 : 700 and filtered. Ultrafiltration was performed under nitrogen pressure (18-30 c. of mercury) at room temperature, through gradocol membranes, as described by ELFORD [*V.B.* **3.** 242].

The filtration end point was found to be 400 $m\mu$, and by the application of Elford's correction factor the diameter of the psittacosis virus was found to be 200-300 $m\mu$.—D. L. HUGHES.

LOURENS, L. F. D. E., & DE GIER, C. J. (1937). Actieve immunisatie tegen de varkenspest, met formolvaccin. [**Immunization against Swine Fever**].—*Tijdschr. Diergeneesk.* **64.** 326-342 and 398-411. [16 refs.] [English, French and German summaries].

Following Jérakado's technique, as modified by MICHALKA, a formol vaccine was made from the organs of pigs suffering from acute S.F., which when injected twice at 10 days interval in a dose of 10-30 c.c. produced in 35,000 pigs an immunity sufficient to make a considerable diminution in the mortality rate. The immunity is said to be practically always strong enough to resist a spontaneous infection in pigs which are brought on to a farm where the disease has occurred, and where the usual cleansing and disinfection of the sties has been effected. The virus in the vaccine is either dead or attenuated to such a degree, that the vaccinated animals cannot spread the virus. The author emphasizes the danger of local infection at the site of inoculation if due care is not taken.—C. B. (SCHIEDAM).

I. MICHALKA, J. (1933). Die bisherigen Erfahrungen mit der Vakzination gegen Schweinepest. [**Experience with Vaccination against Swine Fever**]. —*Wien. tierärztl. Mschr.* **20.** 849-855.

II. WALLA, H. (1936). Beitrag zur Bekämpfung der chronischen Schweinepest der Ferkel durch Impfung mit einer Schwienepestvakzine. [**Control of Chronic Swine Fever by Vaccination**].—*Ibid.* **23.** 746.

I. M. prepared a vaccine by taking the liver and spleen of pigs killed at the height of S.F., mincing the tissues and suspending them in formol-saline (0·3% formalin) for 24 hours at room temperature. At this stage the substance is still virulent, so to make it avirulent it is filtered and the residue desiccated in a Faust-Heim apparatus, pulverized and added to the filtrate, which has meanwhile been stored in an incubator for 48 hours. This procedure is said to kill the virus, but not to impair antigenic action. The vaccine has been widely used in Austria, Hungary, Switzerland and Yugoslavia.

II. During 2 years 4,287 piglets of 516 litters born on a large pig farm, previously suffering annual losses of up to 28% from swine fever were vaccinated with Michalka's vaccine. Total mortality from all causes averaged 18% over the 2 years, losses before, during and after the vaccination being 12·7%, 5% and 5% respectively. The sooner after birth the piglets were vaccinated the better were the results.—J. E.

JACOTOT, H. (1937). La vaccination contre la peste porcine au moyen d'émulsions organiques avirulentes. [**Vaccination against Swine Fever by Avirulent Organ Extracts**].—*Bull. Acad. vét. Fr.* **10.** 276-279. [5 refs.]

Avirulent tissue extracts are prepared from pigs infected with swine fever in a manner similar to the preparation of rinderpest tissue vaccines. The most suitable tissues are found to be the spleen, lymph nodes and bone-marrow. The material is obtained on the eighth day after infection, when the thermal reaction is at its height. It is pulped and treated with 0·8% formol saline, and the coarse particles are removed by passage through gauze. After incubation of the pulp for 24 hours at 37°C. glycerin is added in the proportion of two parts by weight of pulp to one part of glycerin, and the vaccine is maintained at 30°C. for three days before use. A single dose of vaccine is found to be sufficient in most cases to confer an immunity against the inoculation of virulent blood or infection by contact after an interval of three weeks or more.—E. C. HULSE.

JACOTOT, H. (1937). Sur le domaine zoologique du virus de la peste porcine. [**Species of Animals Susceptible to Swine Fever**].—*Bull. Acad. vét. Fr.* **10.** 280-283.

Swine fever virus was inoculated into horses, cattle, sheep, goats, g. pigs, rabbits, dogs, cats, monkeys and pigeons. Sheep and goats were fed infective

material. In most cases no symptoms were observed, although a superficial inflammation of the alimentary tract was seen in sheep and goats. The virus was recovered from the blood of animals of all these species. It was present as early as six hours after inoculation in some sheep and goats, and as late as 42 days after in one goat. After several passages through sheep or goats the pathogenicity of the virus for pigs remained unchanged. Virus was also found to be excreted in the milk and urine of infected goats. Immunity to a second inoculation of virulent blood was frequently observed in sheep, goats and calves.—E. C. HULSE.

JANSEN, J. (1937). Phlegmonen bij varkens, na inspuiting met formolvaccin tegen varkenspest. [**Local Inflammation after Injections of Formol Vaccine against Swine Fever**].—*Tijdschr. Diergeneesk.* **64.** 26-32. [English, French and German summaries].

Cases of local cellulitis occurred in pigs, following the subcutaneous injections of formol vaccine against S.F. It is considered that they were due to contamination of the vaccine with *Clostridium oedematiens* Novy.—C. BUBBERMAN (SCHIEDAM).

BLANC, G., & MARTIN, L. A. (1934). La stomatite pustuleuse contagieuse des ovins. Étude expérimentale d'une souche marocaine. [**Contagions Pustular Stomatitis of Sheep**].—*Arch. Inst. Pasteur Maroc.* **1.** 171-196. 12 figs. on 9 plates, 1 table. [Numerous refs.]

The authors transmitted the disease in a benign form to dogs, monkeys, rabbits and human beings. In a sheep inoculated by scarification of the skin the virus was shown to be present in the skin and brain. It remained fully virulent after serial passage in rabbits by intracerebral inoculations. If virus suspensions are digested with pancreatic juice or allowed to stand at 37°C. in distilled water for five hours the virus becomes filtrable. A local but not a general immunity is developed in the rabbit after a primary infection, and this confers no resistance to infection by other dermotropic viruses. Vaccination has given good results in sheep.
—P. S. WATTS.

I. BEARD, J. W., & WYCKOFF, R. W. G. (1937). **The Isolation of a Homogenous Heavy Protein from Virus-Induced Rabbit Papillomas.**—*Science.* **85.** 201-202. [9 refs.]

II. RIVERS, T. M., & WARD, S. M. (1937). **Infectious Myxomatosis of Rabbits. Preparation of Elementary Bodies and Studies of Serologically Active Materials Associated with the Disease.**—*J. exp. Med.* **66.** 1-14. 7 figs. on 2 plates. [14 refs.]

III. PEYRON, A., LAFAY, B., & POUMEAU-DELILLE, G. (1937). Sur la régression du papillo-épithéliome du lapin (tumeur de Shope) sous l'action de la colchicine. [**The Regression of Shope's Rabbit Papilloma After Treatment with Colchicine**].—*C. R. Acad. Sci., Paris.* **205.** 378-380. 3 figs.

I. The authors have isolated from virus-induced warty growths of cottontail rabbits a high molecular weight protein which is associated with the infectiousness of the disease. This material yielded 15% nitrogen by Kjeldahl analysis. The heavy protein is completely coagulated at 66°-67°C. The infectious activity is completely destroyed at 70°C. The molecular weight of this protein is calculated to be about 20,000,000, the particles being about 40 $m\mu$ in diameter. The heavy protein is several thousand times more infectious than the original wart tissue from which it was obtained. Domestic rabbit wart tissue in which no virus could be demonstrated failed to yield this heavy protein.

II. Large amounts of myxoma elementary bodies may be obtained by the

inoculation of the shaved backs and flanks of rabbits. The material is harvested from the thickened erythematous skin on the fifth day. The material is cleared by frequent centrifuging. [The original article should be consulted for details]. These elementary bodies which can be stained and observed microscopically represent the aetiological agent or are closely associated with it. They can be specifically agglutinated by anti-myxoma serum, and to a lesser extent by anti-rabbit fibroma serum. The tumours thus appear to be antigenically related. Precipitinogens are demonstrable in virus-free extracts of affected skin, and also in the virus-free serum of affected rabbits acutely ill with myxoma virus infection.

III. Fifteen rabbits inoculated with Shope's rabbit papilloma were treated with colchicine, receiving a total dose of 12-15 mg. Twelve control rabbits also inoculated with the same papilloma showed the usual development of the tumour followed by death, with the exception of one rabbit in which the papilloma regressed. The tumours in the treated rabbits regressed in from 3-5 weeks, although the age of the tumours varied from 1-4 months. In a further series of experiments it was found that similar results were obtained by local applications of colchicine.—D. L. Hughes.

I. McGowan, J. P. (1937). **Sarcomatosis in Fowls following Weasel Bites with a Discussion on Tumour Formation in General.**—*Edinb. med. J.* **44.** 37-45. [Numerous refs.]

II. Jobling, J. W., & Sproul, E. E. (1937). **Relation of Certain Viruses to the Active Agent of the Rous Chicken Sarcoma.**—*Science.* **85.** 270-271. [10 refs.]

III. Claude, A. (1937). **Properties of the Causative Agent of a Chicken Tumor. XIII. Sedimentation of the Tumor Agent, and Separation from the Associated Inhibitor.**—*J. exp. Med.* **66.** 59-72. 4 tables. [16 refs.] [See also *V. B.* **5.** 530].

I. Two cases of tumour formation on the under surface of wings, following weasel bites, are very briefly described. In one bird the wing tumour was the size of a pigeon's egg and circumscribed nodules were also present in the liver. The other bird had a tumour in the axilla half the size of a small orange and secondary growths in the lungs and on the surface of the proventriculus. The rest of the article is a general discussion on tumour formation.

M. considers that tumours are induced by irritation and hyperstimulation to a stage of uncontrolled tissue growth associated with dysfunction. In tumours of the reticulo-endothelial system, it is suggested that specific stimulants are produced by the tumour cells which induce the undeveloped cells of the R. E. S. to develop along the lines of the originating neoplastic cell.

II. The authors have previously shown [(1936.) *Science.* **84.** 229.] that the lipid fraction of the Rous chicken sarcoma is capable of setting up the disease on inoculation. It is known that bacteriophage and the virus of tobacco mosaic disease are protein in nature, and it is unlikely that they could be recovered from a lipid extract. This hypothesis was tested with the viruses of vaccinia and tobacco mosaic disease. They were extracted with carbon tetrachloride, petroleum-ether, or equal parts of petroleum-ether and chloroform. These extracts were inactive, except in the case of the Rous chicken sarcoma. The authors suggest that the lipid extract of the Rous chicken sarcoma is not a living agent, but a product of abnormal cell metabolism.

III. The agent causing chicken sarcoma I was separated from the other constituents of the tumour by high-speed centrifugation. This was accomplished in a centrifugal field of 14,000 times gravity acting for two hours. Relative purifi-

cation was obtained by differential centrifugation and washing in Tyrode's solution or distilled water. The washed sediment gave an opalescent solution composed of minute particles of approximately equal size. The size of these particles on calculation was in fair agreement with that given by ELFORD and ANDREWES from the results of filtration namely 70 $m\mu$ [*V. B.* **5.** 561]. The tumour-producing activity of this sediment was significantly greater than that of the original filtrate. This difference in activity, it is suggested, is due to the removal of an inhibitory factor which occurs in chicken tumour extracts.—D. L. HUGHES.

KENDALL, A. I. (1936). **The Elicitation of Specific Phage from Autoclaved (Lifeless) Material. Studies in Bacterial Metabolism. CVII.**—*J. infect. Dis.* **59.** 340-348. [10 refs.]

K. claims to have isolated from autoclaved sewage a specific bacteriophage for certain strains of bacteria, *viz* five strains of *Bact. coli*, one strain of the Shiga bacillus and one strain of *Salmonella paratyphi* B. He interprets his experiments as indicating that bacteriophage is not a living entity.—A. ROBERTSON.

PARASITES IN RELATION TO DISEASE [ARTHROPODS].

MARKOV, A. A., & BOGORODITZKII, A. V. (1935). **The Biology of the Tick *Boophilus calcaratus* Bir.**—*Trud. vsesojuz. Inst. eksp. Vet.* **11.** 110-114. [3 refs.] [In Russian: French summary]. [Copied *verbatim* from *Rev. appl. Ent.* **25.** 241].

Investigations in 1932 on the cattle tick, *Boophilus calcaratus*, Bir., in a locality in western North Caucasus showed that three overlapping generations were produced annually, development continuing from the beginning of April until about October. The life-cycle from egg to adult was completed in about 2 months, oviposition beginning 4-9 days after the engorged females dropped and the eggs hatching in 28-30 days. The larval and nymphal stages apparently lasted 7-8 days each, and engorged females occurred 7-8 days later. In view of the fact that the generations overlap, cattle require to be dipped frequently, especially at the time of the appearance of the larvae.

KURCHATOV, V. I. (1935). **The Distribution of *Boophilus calcaratus* Bir. in the U. S. S. R.**—*Trud. vsesojuz. Inst. eksp. Vet.* **11.** 115-123. [11 refs.] [In Russian: French summary]. [Copied *verbatim* from *Rev. appl. Ent.* **25.** 241-242].

Data on the distribution of *Boophilus calcaratus*, Bir., in the Russian Union are summarised, and a brief survey is given of the characters of the areas in which it is found. It occurs only in the southern zone, the northern limit of its range being 48-49°N. Lat. in the Ukraine, 45-49° in North Caucasus, 44-45° in Daghestan, 38-40° in Turkmenistan, and 43-44° in southern Kazakstan. As a moist climate combined with high temperature is indispensable for it, it is usually present in forest or semi-forest land at the foot of mountains or in mountainous regions up to 2,600 ft., in semi-steppe areas and in land covered with brushwood. In the steppes and arid zones it only occurs under the cover of trees, brushwood or tall grasses close to water. It is most numerous and widely distributed in the southern part of North Caucasus, becomes progressively less so in Transcaucasia, Uzbekistan, Crimea and Tadzhikistan, and is rare elsewhere. Cattle diseases caused by *Piroplasma bigeminum*, *P. major* (*Francaiella colchica*) and *Anaplasma rossicum* are frequent in infested localities, and in North Caucasus outbreaks occur in years

having a wet spring and summer. The distribution and abundance of *B. calcaratus* are greatly influenced by the numbers of cattle present, the length of time they remain in a pasture, and the frequency with which they are driven to and from it, as in many instances they carry ticks with them to uninfested ground.

MacLeod, J. (1937). **The Nature, Epidemiology and Control of Sheep Myiasis in Britain.**—*J. comp. Path.* **50.** 10-32. 1 table. [Numerous refs.]

The author reviews cutaneous myiasis of animals in general, and puts forward the theory that the habit of striking living animals can be explained in terms of the normal carrion-infesting habit of many diptera. He points out that there is no evidence that strike ever occurs except as a response to the presence of raw flesh or of organic decomposition.

Five species of flies were bred from larvae infesting living sheep in Britain [*V. B.* **7.** 537.]; with three of these, *Lucilia sericata*, *L. caesar* and *Phormia terraenovae*, strike was produced experimentally. In addition to larval myiasis, serious aggravations of existing lesions sometimes result from the activities of non-biting adult flies.

The records of sheep blowfly outbreaks in Britain and the habits of the principal blowfly *L.s.* are reviewed. The susceptibility of different breeds is shown to be an important factor governing strike incidence, mountain breeds being less susceptible than Down breeds. In mountain breeds body strikes are commoner than breech strikes, and the presence of extraneous organic matter in the fleece is suggested as a cause of many of these.

Methods of control are discussed and a scheme of three summer dippings, based on the observed periodicity of strike incidence is outlined.

PARASITES IN RELATION TO DISEASE [HELMINTHS].

Graham, R., Torrey, J. P., Mizelle, J. D., & Michael, Viola M. (1937). **Internal Parasites of Poultry and Common Intermediate Hosts. With Directions for Parasite Eradication and Control.**—*Circ. Ill. agric. Exp. Sta.* No. 469. pp. 50. 39 figs. [Numerous refs.]

This publication, presumably intended for circulation among poultry keepers, deals with helminth parasites. Two species of flukes, five of tapeworms, and seven of roundworms are dealt with at length in the text, but some others are included in a comprehensive list which is given of parasites and their hosts.

Stress is laid upon the necessity of P.M. examination in diagnosis and upon the importance of good hygiene in control.—W. J. Ironside.

Fenwick, D. W. (1937). **A Census of Intestinal Parasites of Lambs in South Wales.**—*J. Helminth.* **15.** 168-176. 2 tables. [8 refs.]

The number of different species of parasites present in apparently normal lambs reared in South Wales was determined by examining the alimentary tracts of 83 animals, all under 12 months old, at the rate of three a week during the period July to February at an abattoir.

Ostertagia circumcincta, which is believed to be a common cause of disease in the area, was the commonest nematode encountered, all the lambs being infected with it. Usually it was present in the abomasum only, but it was also found in the small intestines of 25% of the lambs examined. Its presence in the latter site was not believed to be due to migration, but to the effect of external conditions on the infective stage of the parasite, since it was often present in this region without a

heavy infestation of the abomasum. On the other hand *Haemonchus contortus*, when observed, was always confined to the abomasum.

Trichostrongylus vitrinus occurred in 25-30% of the lambs and the chief site of infection was the abomasum, only small numbers being detected in the intestine. *Chabertia ovina* was present in 59% of the lambs. Most frequently it was found in the large intestine, although caecal infections were not infrequent. In heavily infected cases the lambs were in poor condition and the intestinal mucous membrane was usually inflamed.

The results showed that there was a decrease in the severity of infestation from September to February and this is believed to be due to the fact that sheep are brought down from the mountains to better pastures in the autumn, thus improving the state of their nutrition and resistance to parasitic infestations.

—F. Blakemore.

Hsü, Y. C. (1935). **Trematodes of Fowls in Soochow.**—*Peking nat. Hist. Bull.* **10.** 141-150. [Abst. from abst. in *Helminth. Abstr.* **4.** 190].

The following species of worms from fowls, ducks and geese are described; *Opisthorchis anatis*, *Prosthogonimus japonicus*, *P. leei n. sp.*, *Echinostoma revolutum*, *E. minor n. sp.*, *E. elongata n. sp.*, *Hypoderaeum sinensis n. sp.* and *Paramonostomum ovatus n. sp.*—J. E.

I. Cawston, F. G. (1937). **Ducks and Bilharzia Disease. [Correspondence].** —*Brit. med. J.* Feb. 13th. 362.

II. Cawston, F. G. (1937). **Domesticated Duck and Fluke Disease.**—*Rhod. agric. J.* **34.** 239-240.

III. Cawston, F. G. (1937). **The Resistance of** *Melanoides tuberculata* **(Müller) to Schistosoma.**—*J. trop. Med. (Hyg.).* **40.** 16. [7 refs.]

IV. Cawston, F. G. (1937). **The Control of the Bilharzia Snail-Host in South Africa and Other Countries.**—*Ibid.* 56-57. [3 refs.]

V. Cawston, F. G. (1937). **The Effect of Fish Culture on Fasciola Infection and Schistosomiasis.**—*Ibid.* 103-104. [2 refs.]

I. It is stated that ducks consume bilharzia-infected snails, as does also the African jaçana, and it is recommended that the latter bird should be protected.

II. C. has observed that domesticated ducks readily devour non-operculated species of water-snails, and considers that the introduction of ducks to badly infected fluke areas in Africa might lower the incidence of fluke disease in man and animals.

III. C. finds no evidence from his own study of schistosomes or in the recorded work of others to show that *Melanoides tuberculata* acts as an intermediate host for schistosomes.

IV. Existent control measures are mentioned and other additional ones suggested, including the introduction of domesticated ducks. It is pointed out that the particular measures necessary must differ in different areas according to the species of snail that serves as a host for the parasite.

V. Observing that certain fish devour free-swimming liver flukes and that others consume certain snails, C. considers that the introduction of the fish might be a valuable measure of control. It is pointed out, however, that infection is commonest under conditions which would be quite unsuitable for the fish.

—W. J. Ironside.

Diss, A. (1937). Biologie de *Fasciola hepatica* L. dans use localisation aberrante. **[The Biology of** *F. hepatica* **in an Abnormal Habitat].**—*C. R. Soc. Biol.*

Paris. **125.** 157-158. [Copied *verbatim* from *Trop. Dis. Bull.* **34.** 867. Signed C. L.]

A subcutaneous infra-mammary tumour removed in Marseilles from a woman of 60 had this fluke within it. The state of the surrounding tissues is described.

ZOTTA, G., RADACOVICI, E., & DIMITRIU, O. (1937). Un cas de distomatose humaine à *Fasciola hepatica.* [**Human Infection with** *F. hepatica*].—*C. R. Soc. Biol. Paris.* **125.** 82. [Copied *verbatim* from *Trop. Dis. Bull.* **34.** 866. Signed C. L.]

A well-attested case of infection of man by *F. hepatica* in Rumania.

The eggs were typical and were found not only in the faeces but also by the duodenal sound. The patient complained of pain over the gall bladder radiating upwards, nausea, vomiting, and had an eosinophilia of 9 per cent.

BEAVER, P. C. (1937). **Experimental Studies on** *Echinostoma revolutum* **(Froelich) a Fluke from Birds and Mammals.**—*Illinois biol. Monogr.* **15.** No. 1. pp. 96. 5 text figs., 29 figs. on 3 plates, 9 tables, 20 charts. [Numerous refs.]

The main object of the studies recorded here was to establish facts which would make for the certain identification of *E. revolutum* and a detailed description is given of all stages of the parasite.

The feature of greatest significance in the identification of both cercariae and adults was found to be the number, arrangement and relative size of spines on the cephalic crown. The size of the adult was found to vary within wide limits and some variation in development was observed depending upon the host.

Examination of the literature showed that, of 18 species reported as differing from *E. revolutum*, eight were almost certainly identical with it, eight were in all probability identical and that only the remaining two showed characters whereby they could be differentiated.

Hosts both of cercariae and adults are shown to be very numerous, those of the adult including the fowl, goose, swan, pigeon, cat, dog, pig and also man.

—W. J. IRONSIDE.

JONES, Myrna F. (1936). **A New Species of Cestode,** *Davainea meleagridis* **(Davaineidae) from the Turkey, with a Key to Species of Davainea from Galliform Birds.**—*Proc. helminth. Soc. Wash.* **3.** 49-52. 1 fig.

The parasite described is a small one measuring up to 5 m.m. in length and consisting of 17-22 segments. It was found in the duodenum of a turkey.

The key given permits of its differentiation from six other species of *Davainea.*

—W. J. IRONSIDE.

I. DÉVE, F. (1936). L'échinococcose expérimentale. [**Experimental Echinococcosis**].—*3rd int. Congr. comp. Path. 1936.* **1.** Pt. 1. Med. Sect. 1-26. 1 table. [In French].

II. POSSELT, A. (1936). Ueber die Natur des Echinococcus alveolaris und seine Beziehung zum Echinococcus hidatidosus. [**Alveolar and Hydatid Echinococcus**].—*Ibid.* 27-55. [Numerous refs.] [In German: French summary].

III. MOLLOFF, W. (1936). Die Echinokkenkrankheit beim Menschen in Bulgarien. [**Human Echinococcosis in Bulgaria – Reference to Animals**]. —*Ibid.* **2.** 137-142. [In German].

IV. DUNGAL, N. (1936). Vers la disparition totale des kystes hydatiques en Islande. [**The Disappearance of Echinococcosis in Iceland**].—*Ibid.* 392-393. [In French].

I. A historical outline of the experimental work is given. The subject is then dealt with from three main aspects :– (1) primary experimental echinococcosis – the primary host, resistance of the egg, release of the embryo, invasion of the secondary host, distribution and localization of the primary cysts, evolution and involution of the lesions and organic reactions ; (2) secondary experimental echinococcosis – five forms being described – local, diffuse, of the serous membranes, of the mucous membranes and embolic or metastatic ; (3) experimental study of the biology, pathology and therapeutics by means of artificial culture and the production and treatment of the disease in animals.

II. This article supports the contention that *E. alveolaris* and *E. hydatidosus* are not identical parasites. The argument is based on :–

(a) Variation in geographical distribution.

(b) Pathological features in which *E.a.* is characterized by the special stroma which surrounds it, the intensity of the pericystic reaction, the smallness of its alveoli and the fact that there is no change in its appearance in whichever organ it develops. The two forms of the parasite may be found in the same host, but each retains its individual characteristics. There is no intermediate form known, and if *E.h.* in bone somewhat resembles *E.a.*, it is because it has to accommodate itself to the nature of its environment.

(c) Histological differences, *e.g.*, *E.a.* sometimes has a double germinal membrane, the appearance of its scolices and hooklets is different from those of *E.h.*

(d) Biological characters, such as the absence of daughter cysts in *E.a.* and the presence of an external germinal membrane, as well as the lesser degree of eosinophilia to which it gives rise and the different results obtained by the c.-f. test. Moreover, each type is reproduced following artificial infection.

III. In Bulgaria 33% of the cattle and 75% of the sheep are affected with echinococcosis. In some districts 51·9% of the dogs harbour *Taenia echinococcus*. Only *E. polymorphus* has been found. M. suggests why the organ (the lungs) most commonly affected in herbivorous animals is not that (the liver) most commonly affected in omnivorous ones.

IV. Echinococcosis, at one time very prevalent in Iceland, is now rare. This is due to the adoption of the following prophylactic measures, (1) education of the public ; (2) compulsory annual treatment of dogs ; (3) imposition of a tax on dogs ; (4) complete exclusion of dogs from Reykjavik ; (5) centralized slaughtering and meat inspection, and (6) controlled disposal of offal. The first of these is the most important.—G. WILLIAMSON.

WIGAND, R. (1936). Klinisch-parasitologische Beobachtungen II. [**Clinical Helminthological Investigations in East Prussia**].—*Dtsch. med. Wschr.* **62.** 175-177. 3 tables. [11 refs.] [Abst. from abst., in *Helminth. Abstr.* **5.** 13].

Of veterinary interest is the observation that dogs infested with *Taenia serrata* never carried *Dibothriocephalus* as well, although the latter was prevalent.

FREEBORN, S. B., & STEWART, M. A. (1937). **The Nematodes and Certain Other Parasites of Sheep.**—*Bull. Calif. agric. Exp. Sta.* No. 603. pp. 75. 17 figs., 1 table. [Numerous refs.]

All the species of nematodes known to affect sheep, together with the liver fluke and two cestodes (*Moniezia expansa* and *Taenia fimbriata*), are described in detail, including their morphology, life-history, distribution in nature, the organs affected in animals and the type of egg or larva present in the faeces. The P.M. technique best designed to demonstrate the presence of parasites is given, together with a description of the various measures used to prevent heavy worm infestation

and the treatment to be adopted should this occur. Numerous prescriptions and the methods of preparation are given. A key for the identification of the various species is included.—P. S. WATTS.

CUVILLIER, Eugenia. (1937). **The Nematode, Ornithostrongylus quadriradiatus, a Parasite of the Domesticated Pigeon.**—*Tech. Bull. U.S. Dep. Agric.* No. 569. pp. 36. 6 figs., 7 tables. [Numerous refs.]

The disease with which this parasite is found associated is an acute condition giving rise to symptoms of severe general disturbance, excessive thirst and a greenish diarrhoea. Mortality in reported outbreaks is variable, but is generally heavy. The experimental studies recorded show that the eggs of the parasite require moisture for development and that under favourable conditions development to first stage larva takes place in 19 hours, from first to second stage in a further eight hours and to third stage in three days. First and second stage larvae were unable to withstand drying and were killed almost immediately on being heated in water. Direct sunlight and drying were found to be harmful to third stage larvae, but exposure to cold had practically no effect. On feeding infective larvae to pigeons symptoms of illness appeared on the second or third day, ending in death on the second to the fifth day. Adult female worms containing eggs were found present on the fifth day.

The only result of feeding infective larvae to 12 chickens, two turkeys and one duck was the development of a few fourth stage larvae in one of the chickens.
—W. J. IRONSIDE.

MOORTHY, V. N. (1937). **A Redescription of** *Dracunculus medinensis*.—*J. Parasit.* **23.** 220-224. 14 figs. on 3 plates. [Copied *verbatim* from *Trop. Dis. Bull.* **34.** 893. Signed C. L.]

The number of dogs in which dracunculus infection has been experimentally established is now 6 and from them 47 male and 181 female guineaworms have been got, the males from 1·2 to 2·9 cm. long, the females from 1·5 to 53. The anatomy of the sexes is described, the males having equal spicules 490 to 730μ, and a gubernaculum, 200μ long. The vagina contains a mucoid plug when the female has reached 24 mm. long, and since no males were found when the infection had reached an age of six months it is felt that impregnation must take place in the early months.

CH'IN. Y.-T. (1937). **Trichinella Infection in a Cat in Mukden.**—*Chin. med. J.* **51.** 500-501. 3 figs. on 1 plate. [Copied *verbatim* from *Trop. Dis. Bull.* **34.** 883. Signed C. L.]

In reporting trichinella infection in the tongue of a cat in Mukden (the rest of the animal had long since been destroyed), Ch'in takes the opportunity of correcting the statement of FAUST (1929) that " neither pigs nor rodents have thus far been found infected in China, thus refuting the theory that the disease was introduced into Europe with the Chinese pig (1820-1830)," seeing that MANSON reported it in Chinese pork in the China Imperial Customs Medical Reports of 1880-81.

SCHEIFLEY, C. H. (1937). **The Localization of** *Trichinella spiralis* **in the Muscle of its Host.**—*Amer. J. Hyg.* **25.** 349-353. [13 refs.] [Copied *verbatim* from *Trop. Dis. Bull.* **34.** 883. Signed C. L.]

In 5 bitches the entire left lumbar sympathetic chain and ganglia were removed and 4 months later they were fed on trichinous meat. Although, as measured by

HERRICK, ESSEX and BALDES, the flow of blood in the left hind leg would thereby be doubled, the numbers of trichinae in that limb were not increased. As usual they were greatest in the diaphragm.

BEAUDETTE, F. R. (1936). **Microfilaria in a Duck.**—*J. Amer. vet. med. Ass.* **89.** 589-590. [1 ref.] [See also *V. B.* **7.** 474].

B. reports the finding of microfilariae in the blood of a wild duck in North America. He mentions a previous report of a similar finding [*V. B.* **5.** 447.] and thinks it probable that blood parasites are more prevalent in wild birds than is usually supposed.—E. L. TAYLOR.

NORDSTRÖM, G. (1937). Mikrofilarios hos häst. [**Microfilariasis in the Horse**]. —*Skand. VetTidskr.* **27.** 355-364. [7 refs.] [English summary].

The occurrence of microfilariasis in the horse in Sweden was first described by BLANCK in 1925. Four further cases detected since 1934 at the Veterinary College, Stockholm are here described. The significance of these blood parasites, *e.g.*, their possible connexion with more or less persistent diarrhoea and retarded development of young horses is mentioned in passing, but is said to have been made the subject of further investigations. The problem is complicated by the fact that all affected animals were found to be harbouring strongyles and ascarids in their intestines in addition to the blood parasites.

Large scale examinations of blood samples taken from horses in the autumn (October to November) revealed no cases of microfilariasis, whereas, of 75 horses examined during the winter (February to March) 60% of the yearlings, 15·4% of the two-year-olds and one out of nine older horses were found to have microfilaria in their blood, and, in addition to be infected with both strongyles and ascarids. Observations are recorded supporting the view that the microfilariae are developmental stages of *Setaria equina*.—GUSTAV NAERLAND (OSLO).

PANDE, P. G. (1936). **On the Identity of the Nematode Worm Recovered from Hump Sore of Cattle in India.**—*Indian J. vet. Sci.* **6.** 346-351. 6 figs. on 2 plates, 1 table. [7 refs.]

The nematode causing lesions in the hump of cattle in India [*V. B.* **6.** 658.] is now described as a new species under the name *Stephanofilaria assamensis*. It differs from the members of the other two species of the genus in that it is markedly broader. The females are distinctly longer and the vulvar orifice is the same distance from the anterior extremity as is that of *S. stilesi* and in this respect both these species differ from *S. dedoesi*. The left spicule in the male is much smaller than in the other two species. For the purposes of classification the position of the cephalic spines is considered to have no value, as the symmetrical distribution may be disturbed under physiological strain.—G. WILLIAMSON.

I. ALICATA, J. E. (1937). **The Gizzard-Worm, and its Transmission to Chickens in Hawaii.**—*Circ. Hawaii agric. Exp. Sta.* No. 11. pp. 7. 4 figs.

II. JERSTAD, A. C. (1937). **Further records of the Gizzard Worm, Amidostomum anseris, in the State of Washington. Report of Cases in Wild Waterfowl.** —*J. Amer. vet. med. Ass.* **90.** 785-786. 1 table. [1 ref.]

I. A. has found the larvae of the gizzard worm, *Cheilospirura hamulosa* occurring naturally in the flour beetle, the sand beetle and in certain species of grasshoppers, and after feeding of gizzard worm eggs, larvae were found in grasshoppers, sandhoppers, beetles and weevils. The experimental feeding of grasshoppers to chickens resulted in the infestation of two out of eight.

II. *A.a.* was found in the gizzards of five wild water-fowl from Long Beach, Washington. Of two common Canada geese examined, 12 specimens were found in one and three in the other; of two American widgeons, one was not infested, but in the other two specimens were found; a few were also found in a lesser Canada goose.—W. J. IRONSIDE.

IMMUNITY.

SVENDSEN, A. (1937). Om Muligheder for Fejlslag ved Tuberkulinprøver. [**Sources of Error in Tuberculin Testing**].—*Medlemsbl. danske Dyrlaegeforen.* **20.** 241-251. [1 ref.]

According to different authors erroneous results are obtained in an average of 10% of the tuberculin tests carried out. S. summarizes the possible sources of these errors under the following headings :– (1) Infected animals which yield false negative reactions – (a) non-clinical cases; (b) new infections in the pre-allergic stage with no anatomically demonstrable lesions; (c) animals with old and possibly healed lesions; (d) advanced generalized cases in an anergic condition. (2) Uninfected animals which yield false positive reactions – (a) animals infected with the avian or human type or with Johne's disease; (b) false positive reactions due to the non-specific constituents of the tuberculin; (c) false positive skin reactions due to trauma or " bites " of flies. (3) Results due to erroneous measurements and interpretations of the reactive swellings. (4) Erroneous application of the tuberculin (depth into the skin, etc.). (5) Individual differences in skin thickness.

—GUSTAV NAERLAND (OSLO).

NEILSEN, F. W. (1937). Tuberculinprøverne. Bevillinger-Regninger. [**State Expenditure on Tuberculin Tests, Denmark**].—*Medlemsbl. danske Dyrlaegeforen.* **20.** 344-351.

State expenditure on free tuberculin tests has grown from 44,117 kroner in 1933-1934 to 254,310 kr. in 1936-1937. The article discusses the work and makes suggestions with a view to intensification of the campaign.—H. C. B. (COPENHAGEN).

CONCEICAO, J. M. (1936). Sôbre a tuberculinisacão intradérmica nos suinos. [**Intradermal Tuberculin Tests on Swine**].—*Rev. Med. vet., Lisboa.* **31.** 108-113. 4 figs., 2 tables.

Of 77 sows injected intraderm. with 0·1 c.c. of bovine tuberculin 13 reacted slightly and 2 strongly. The negative and doubtful cases were retested after 6 days with a double dose of tuberculin. Of these 2 reacted positively. All results were confirmed by P.M. examination.—J. A. PASFIELD.

DONHAM, C. R., & FITCH, C. P. (1936). **A Modified Technic for Agglutination in Brucella Infection.**—*J. infect. Dis.* **59.** 287-295. [14 refs.]

A system of serum-antigen mixtures was devised in which varying amounts of agglutinating serum and constant weights of bacterial antigen were brought together without any added water. The results obtained with this technique showed that the presence of agglutinins in some cases may be detected earlier in the course of the disease than when the agglutination test, as usually carried out, is employed. Its use for the routine diagnosis of brucellosis in animals is not, however, considered to be practical.—F. BLAKEMORE.

WALL, S. (1937). Komplementbindningsreaktionen vid sjukdomen smittsam kastning hos nötkreatur. [**The Complement-Fixation Reaction in Brucella Infection in Cattle**].—*Skand. VetTidskr.* **27.** 461-489. 9 tables. [1 ref.] [English summary].

Instead of using heat inactivation of serum, W. recommends non-inactivated sera, or better, phenol-inactivated, for the complement-fixation test. It is emphasized that agglutination alone always signifies a disappearing reaction, never that the animal has recently been infected. The reaction begins sometimes with agglutination and complement-fixation together, sometimes, with c.f. alone, but never with aggl. alone. When reactions are disappearing those to both tests occasionally disappear at the same time, but sometimes c.f. disappears alone and sometimes aggl. alone.

Sero-reactions in herds are interpreted by means of the aggl. and c.f. tests according to the following rules :– (1) aggl. with 0·01 c.c. of serum indicates that the animal is infected (c.f. test is not carried out); (2) aggl. with 0·05 c.c. of serum and positive c.f. indicates infection ; (3) aggl. with 0·05 c.c. of serum and no c.f. indicates infection although it is now disappearing ; (4) aggl. with 0·1 c.c. of serum and positive c.f. indicates infection ; (5) aggl. with 0·1 c.c. of serum and no c.f. indicates that the animal was infected, but that it is now free from infection, (6) aggl. with 0·2 c.c. of serum and positive c.f. indicates that the animal may be considered to be infected ; (7) aggl. with 0·2 c.c. of serum and no c.f. indicates that the animal was infected some time ago, but not now ; (8) no aggl. with 0·2 c.c. of serum or smaller doses and positive c.f. means that the animal may be considered to be infected, and (9) no aggl. with 0·2 c.c. of serum or smaller doses and no c.f. indicates that the animal has no infection or (in an infected herd) that it is not yet infected, or that the infection has not yet caused a reaction.

W. lays great stress on the connexion between the aggl. and c.f. tests. The last mentioned should not be overlooked.—H. C. BENDIXEN (COPENHAGEN).

SIMITCH, T. V., & MRCHEVITCH, S. (1937). L'immunité locale et la vaccination antistaphylococcique par voie cutanée. [**Local Immunity and Antistaphylococcal Vaccination**].—*Rev. Immunol.* **3.** 463-471. 2 tables. [3 refs.]

Rabbits were vaccinated by rubbing on the skin a mixture of xylol, mustard oil, lanolin and staphylococcal anatoxin. On control rabbits the xylol and mustard oil mixture was used alone. The immunity thus obtained was tested by the intradermal inoculation of diluted toxin. After two days the skin treated with toxin was immune to the action of toxin, this phenomenon being apparently due in a number of cases to circulating antitoxin.

In a certain proportion of rabbits, however, it would seem that the reaction was due to a change in the skin itself and not to the presence of antitoxin. This immunological response of the skin was, however, specific for staphylococcal toxin.—A. WILSON TAYLOR.

GORDON, W. S. (1937). **The Application of Vaccine Therapy.**—*Vet. Rec.* **49.** 1167-1180. 5 tables. [Numerous refs.]

A general discussion on the subject.—E. J. PULLINGER.

JUSATZ, H. J. (1937). Die Beeinflussung des Immunitätszustandes durch Vitamine. [**Vitamins and Immunity**].—*Ergebn. Hyg. Bakt.* **19.** 464-497. 3 figs. [Numerous refs.]

A review of current opinion on the role played by vitamins in the resistance to infectious disease.

VITAMIN A.—The classical instance of susceptibility to naturally occurring specific xerophthalmia is quoted and both clinical and experimental evidence is advanced indicating clearly that increased susceptibility to suppurative conditions, and in particular to pneumonia appears when a diet is deficient in this vitamin. Furthermore, under experimental conditions laboratory animals show increased susceptibility to salmonella infection if they are fed a vitamin A-deficient diet, but avitaminosis must be severe before its effect is demonstrable. There is no evidence that vitamin administered in excess of a certain basal ration will continue to increase resistance to bacterial invasion.

VITAMIN B.—The lowered resistance of pigeons to erysipelothrix infection as a result of vitamin B deficiency is quoted, but relevant evidence is incomplete.

VITAMIN C.—Considerable clinical and some experimental evidence is available regarding the increased susceptibility to infective complications of animals affected with scurvy. [See *V. B.* **7.** 620].—E. J. PULLINGER.

MENKIN, V. (1937). **Isolation and Properties of the Factor Responsible for Increased Capillary Permeability in Inflammation.**—*Proc. Soc. exp. Biol., N.Y.* **36.** 164-167. [4 refs.]

An inflammatory exudate, freed from cells, is mixed with an equal volume of pyridine. The supernatant fluid is mixed with three volumes of acetone, the precipitate is discarded, and the fluid evaporated to dryness. The residue contains a crystalline fraction which is dialyzable, and this fraction appears to increase the permeability of capillaries, as demonstrated by the use of vital staining. It has no relation to the H substance (histamine) and the name " leukotaxine " is suggested.
—H. H. HOLMAN.

DISEASES, GENERAL.

I. GERLACH, F. (1936). Les porteurs de germes. Leur rôle dans la propagation des maladies animales. [**Carriers of Diseases of Animals**].—*Bull. Off. internat. Epiz.* **12.** 173-193. Discussion pp. 556-572. [2 refs.]

II. MANNINGER, R. (1936). Les porteurs de germes. [**Carriers of Disease**].—*Ibid.* 194-213. Discussion pp. 556-572. [5 refs.]

I. In a general discussion of the importance of carriers in the spread of disease, G. emphasizes the necessity of detecting all infected animals when eradicating an infection. The different methods of detecting such carriers, by direct bacteriological methods, and by the indirect serological and allergic procedures are mentioned. The role of carriers in the following diseases is discussed in some detail :– brucellosis, streptococcal mastitis, foot and mouth disease, swine fever, swine erysipelas, dourine and equine infectious anaemia. The knowledge of the role of carriers of the aerobic and anaerobic spore-bearing organisms is incomplete. Infections of the alimentary tract by the salmonella group of organisms, and the importance of carriers in bacillary white diarrhoea of chickens are also discussed.

II. M. divides carrier animals into two types, (a) true carriers that have never been diseased clinically, but carry organisms which are already, or may, become pathogenic, and (b) permanent excretors, that is to say, animals which, have been affected and recovered apparently perfect health although the organism persists in the body. In sanitary practice both types must be considered as potential sources of infection. The difficulty of eliminating carriers in some diseases is discussed, this difficulty being particularly pronounced in the anaerobic infections

and those due to filtrable viruses. Two methods of dealing with carriers may be adopted according to the infection, firstly by the isolation of such animals, or secondly by the destruction of all infected stock. In carriers of pathogenic bacteria the infection is usually latent.

In the discussion which followed the presentation of these two papers G. stated that there is need for further systematic work on methods of detecting carriers of various bacteria and viruses. The efficiency of " stamping out " where such a procedure was possible, was stressed by both these workers. Other speakers mentioned the difficulty of applying bacteriological and sanitary knowledge to conditions in the field.—D. L. HUGHES.

I. RAKE, G. (1937). **The Rapid Invasion of the Body through the Olfactory Mucosa.**—*J. exp. Med.* **65.** 303-315. 9 figs. on 3 plates, 3 tables. [10 refs.]

II. PICKWORTH, F. A. (1937). **Infection Through the Olfactory Mucosa. [Correspondence].**—*Lancet.* **232.** 1076.

III. RAKE, G. W. (1937). **Infection Through the Olfactory Mucosa. [Correspondence].**—*Ibid.* 1433-1434.

IV. PICKWORTH, F. A. (1937). **Infection Through Olfactory Mucosa. [Correspondence].**—*Ibid.* 1548.

I. Working with mice R. studied the process of absorption and tissue invasion following intranasal instillation of Prussian blue pigment particles, bacteria (pneumococci and *S. enteritidis*), and viruses (St. Louis encephalitis, "louping ill," rabies and eastern equine encephalomyelitis). In the case of pigment, the bacteria and eq. enceph. virus absorption is very rapid, occurring within two minutes by way of the olfactory mucosa. Within this period pigment particles were found in the tissue spaces, inside blood and lymph vessels, in the perineural sheath of the olfactory nerve and in the subarachnoid space and pia mater. The bacteria were absorbed with equal rapidity and from culture tests and direct microscopical examinations it was shown that they immediately reach the cranial cavity. Eastern equine enceph. virus was detected in the forebrain as promptly as were pigment and bacteria, whereas the other viruses dealt with were not found present in the forebrain in less than 24 hours.

II. P. questions the results recorded in I, especially with regard to absorption of pigment particles by the olfactory mucosa and their passage through the tissues. He states that it is erroneous to assume that a mixture of iron ammonium citrate and potassium ferrocyanide solutions constitutes a suspension of Prussian blue. Mixtures in faintly alkaline solutions remain clear with the ingredients in true solution. The presence of pigment particles in the tissues was due to tissue acidity which caused precipitation of particles from the absorbed solution. With regard to the passage of bacteria he feels that the work needs confirmation.

III. R. reinvestigated most of the original work and formed the opinion that he was dealing with a suspension of Prussian blue particles in a solution of Prussian blue. He, however, disagrees with P. that bacteriological methods only were used since he was able to demonstrate microscopically the presence of pneumococci in the perineural spaces, in the subarachnoid space and in the cells of the pia mater within two minutes of their being instilled into the nasal cavity.

IV. P. adheres to his views.—D. R. WILSON.

VAN ES, L., & OLNEY, J. F. (1934). **Diseases of Poultry – Their Nature and Control.**—*Bull. Neb. agric. Exp. Sta.* No. 290. pp. 110. 29 figs., 2 tables.

A very informative bulletin written for farmers. Disease problems are viewed from a flock point of view to the exclusion of individual disorders, and the control

of the infectious diseases in a flock rather than the treatment of individual birds is stressed. The section dealing with hygiene, sanitation, management, and the control of transmissible diseases is particularly well written. The cause, symptoms, P.M. lesions, course and control of the following diseases are fully described :– avitaminosis, favus, tuberculosis, fowl cholera, fowl typhoid, bacilliary white diarrhoea, roup, infectious bronchitis, fowl pox, fowl paralysis, infectious leucosis, blackhead in turkeys, coccidiosis and internal and external parasites.—R. F. G.

ZELLER, H. (1937). Die Ergebnisse des Grossversuchs zur Feststellung der Verbreitung der Rinder-Tuberkulose und Bruzellose. [**Results of Large Scale Tests for Bovine Tuberculosis and Brucellosis in Germany**].—*Dtsch. Tierärztebl.* **4.** 301-304. 2 tables.

Z. records a survey conducted in 1935-36 of the incidence of tuberculosis and contagious abortion in the cattle population of 18 German states. Of 412,184 cattle belonging to 45,945 herds submitted to the tuberculin test, 128,900 (31%) reacted ; of 105,531 under a year old 11·9% reacted and of 306,653 above this age 37·93% reacted. The incidence of infection in relation to the size of the herd is shown and in 621 large herds (over 50 cattle) 84% were highly infected, while only 1·12% were free ; in 23,648 small herds (1-5 cattle) 48% were infected and 52% were free.

Aggl. tests for brucella infection were carried out on both male and female cattle over one year old in practically the same number of herds and out of a total of 276,367, 10·7% were infected ; 10·99% of the female animals and 2·9% of the male animals reacted. It is stated that in only 43 herds had vaccination with living culture been carried out recently. As with TB., the incidence of *Br. abortus* infection was related to the size of herd – of the small herds 85% were free from disease while in the large herds the corresponding figure was 34%. Blood samples from 5,121 young animals (under one year) were submitted to the aggl. test. Of those under 6 months 41 (1·6%) reacted and of those between 6 and 12 months 48 (1·8%) reacted.—S. J. EDWARDS.

VAN VLOTEN, J. M. (1937). Onderzoekingen over de pathogenese van de " groote bleeke nieren " van het rund. [**Large White Kidneys in Cattle**].—*Tijdschr. Diergeneesk.* **64.** 281-286. [English, French and German summaries].

After having studied 44 cases of " enlarged white kidneys " in 15 young and 29 older cattle, van V. concludes that the condition is specific for cattle and consists of inflammatory changes of the glomeruli and interstitial tissues as well as of degenerative changes, mainly amyloid infiltration, in the glomeruli, renal medulla and sometimes in the vessel walls. It seems that in early cases the amyloid infiltration is preceded by the inflammatory changes.—C. BUBBERMAN (SCHIEDAM).

IWANOFF, X. (1937). Ueber generalisierte Xanthinose beim Rinde. [**Generalized Xanthosis in Cattle**].—*Virchows Arch.* **299.** 740-749. 5 figs. [5 refs.]

Only one record of this condition was found in the literature [JOEST, (1907)]. The case described by I. occurred in a 5-6 weeks old heifer calf and was more pronounced than that recorded previously. The animal showed no symptoms during life and, at slaughter, weighed approximately 69 kg. The macroscopic lesions were confined to the spleen, lymph nodes and kidneys. The spleen weighed 1·06 kg. and on section appeared as if the surface had been sprinkled with sand. Neither malpighian corpuscles nor splenic pulp could be seen, but the trabeculae were still visible. The gritty material was identified chemically as xanthine, and only when this had been dissolved by treatment with ammonia was it possible for

sections to be cut. Histologically, the xanthine was found to be within the protoplasm of cells which were probably derived from the splenic reticulum.

All the lymph nodes were slightly enlarged and contained intracellular xanthine within reticulum cells.

The kidneys were slightly larger than normal and showed a yellowish network on the surface and, on section, radial streaks reaching to within a short distance of the pelvis. Xanthine was found within macrophages in the interstitial tissue and free within collecting tubules. There was a severe interstitial nephritis.

In the liver, a few Kupffer cells contained xanthine, as did some of the liver cells, particularly those near central lobular veins. A congenital disturbance of purine metabolism is considered to be the cause of the condition.—E. G. White.

Sedlmeier, H. (1937). Sarkohämochromatose beim Rind. [**Sarcohaemochromatosis in Cattle (Porphyria)**].—*Münch. tierärztl. Wschr.* **88.** 397-398.

A preliminary report is given of a peculiar purplish coloration of the musculature of the diaphragm of the otherwise normal carcass of a bull. A watery extract of the musculature resembled in colour a dilute solution of potassium permanganate.

No bacteria could be isolated from the affected muscle. The muscle fibres showed a myositis, being swollen, fragmented and infiltrated with mononuclear cells.

Examination of the muscle extract by physical and chemical methods showed the coloration to be due to a porphyrin: this probably arose within the muscle fibres by breakdown of haemoglobin or myoglobin with liberation of its iron content. The term "sarcohaemochromatosis" is suggested for the condition.
—E. G. White.

Willenberg, S. (1936). Erhebungen in Beständen mit Rinderleukose und Betrachtungen zur Aetiologie. [**Enquiry into the Aetiology of Bovine Leucosis**].—*Inaug. Diss., Hanover.* pp. 27. 2 tables. [Numerous refs.]

After a review of the literature, W. discusses the replies to questionnaires sent to the owners of 19 herds, comprising 892 animals. Since 1929 there had been 50 deaths from leucosis.

No evidence was obtained in support of the view that water, soil, locality, feeding or management are of importance in the aetiology of the disease. It was not possible to study adequately the influence of heredity. There was no evidence of contact infection from infected to healthy cattle.

The association of bovine and fowl leucosis was very striking and it is suggested that the two diseases may be related in their aetiology.—E. G. White.

Holz. (1937). Beiträge zur Pathologie des Zentralnervensystems. VII. Akute und chronische Erkrankungen des Gehirnes. [**Pathology of the Central Nervous System. VII. Acute and Chronic Encephalitis**].—*Berl. tierärztl. Wschr.* June 25th. 393-395. 1 fig. [See also *V. B.* **7.** 624].

Chronic pathological processes occurring in the brain, especially when accompanied by protrusion at the occipital poles, appear to render the central nervous system more sensitive to the action of toxic agents, which may produce an acute encephalomyelitis with a fatal termination within a few hours or, at most, a few days.

The formation of "cholesteatomata" in the choroid plexuses of the cerebral ventricles in the horse is considered as being possibly the result of a previous attack of acute or chronic encephalitis. It is suggested that careful investigations into the clinical history of animals with such "tumours" might throw light on

the duration of existence of the latter; no reliable information as to the latency is as yet available.—E. G. WHITE.

TELER, I. (1937). Nekoliko slučajeva "*Paraplegia enzootica equorum*". [**Enzootic Equine Paraplegia**].—*Jugoslov. vet. Glasn.* **17.** 73-75. [German summary].

"Enzootic equine paraplegia" occurred in four army horses, only one of which recovered, after three months' general treatment.

From the blood and urine *Streptococcus equi* was isolated. The autopsies revealed hyperaemia of the cerebral vessels and petechiae in both the brain and lumbar parts of the spinal cord.—B. OSWALD (SPLIT).

I. WAY, C. (1936). **Arthritis and its Relation to Common Lameness in Horses.**—*Cornell. Vet.* **26.** 34-50.

II. ANON. (1936). L'ostéite de fatigue du cheval. [**Fatigue Osteitis in the Horse**].—*Rev. gén. Méd. vét.* **45.** 520-522.

I. A further article to that by WAY and HOFFMAN [*V. B.* **5.** 579.] in which certain forms of arthritis are considered of bacterial origin and treatment by specific vaccination, after identifying the organism by complement-fixation, is recommended. Inflammation of the joint, peri-arthritis, early osteo-arthritis, and sidebones, are among the conditions in racehorses for which successful treatment is claimed.

II. WAY'S article is discussed, and the pioneer work of JOLY, now apparently forgotten, is recalled to notice.—NORMAN HOLE.

DEMONT. (1937). Le point de vue immunologique du problème de la cataracte chez l'homme et chez l'animal. [**Immunological Aspect of Cataract in Man and Animals**].—*Rev. Path. comp.* **37.** 777-791. 8 figs. [Num. refs.]

Cataracts are briefly discussed under a clinical classification and their comparative incidence is noted. Their pathogenesis is then described with regard to some of the various theories which have been advanced to explain their origin. It is maintained that, with one exception, each of those theories can be used to explain only one or other of the observed facts. The exception is the theory which holds that bacteria are the primary cause of the great majority of cataracts not produced by mechanical factors and that the organism considered to be most often of aetiological significance is the enterococcus of Thiercelin, or some of the organisms related to it. D. then gives an account in detail of cataracts in a few canine and human cases treated successfully by subcutaneous injections of enterococcus antigen and a collyrium with an enterococcus antigen base. [No details are given to indicate the exact composition of these preparations].—G. WILLIAMSON.

I. DOYLE, L. P. (1937). **Posterior Paralysis in Swine.**—*J. Amer. vet. med. Ass.* **90.** 656-660. 5 figs.

II. EVELETH, D. F., & BIESTER, H. E. (1937). **The Significance of Myelin Sheath Degeneration and its Relation to Incoordination.**—*Amer. J. Path.* **13.** 257-266. 7 figs. on 1 plate, 4 tables. [11 refs.]

I. D. claims to have evidence to show that there is an infectious posterior paralysis of swine. Outbreaks are sporadic and occur under a wide variety of feeding conditions. It affects weaned pigs ordinarily, but sometimes sucking pigs. An early symptom is stamping of the hind feet, followed by paralysis – partial or complete – of the hind limbs. Atypical cases show stringhalt. Muscular atrophy is a common sequel. Histological appearances of lesions in the nerve tissues are described.

II. A short review of previously recorded work is given. Dietetic experiments on swine suggest that the incoordination and the myelin sheath degeneration are caused by different aetiological factors – the latter having been produced in the absence of the former. The results of feeding diets low in content of vitamins A, B_1 and C respectively, are given, and an apparently curative effect on paralysis of feeding skim milk powder *ad lib.* is referred to. The authors believe that unknown disease-causing factors are introduced by efforts to control a given vitamin content.—E. E. JELBART.

UBACH, F. A. (1936). Sobre algunas alteraciones patologicas observadas en frigoroficos del pais. [**Bone Diseases seen in Abattoir Animals in the Argentine**].—*Rev. Med. vet., B. Aires.* **18.** 449-470. 24 figs.

The article describes bone diseases observed in carcasses at meat inspection. They include, in cattle – tuberculous osteomyelitis of the long bones of the limbs, tuberculosis of the sternum, actinomycosis of the sternum and bones of the skull and spinous processes of the thoracic vertebrae, echinococcosis of the ribs and various forms of osteo-arthritis ; in sheep – necrosis of the frontal bone due to a coenurus cyst in the brain and osteomyelitis of the mandible and various forms of osteo-arthritis.—S. TORRES.

SALHOFF, S. (1937). Kasuistischer Beitrag zur Pigmentierung von Knochen. [**Pigmentation of Bones**].—*Z. Fleisch- u. Milchhyg.* **47.** 461.

A record of peculiar greenish foci in the interior of the long bones of an otherwise normal carcass of a goose. No detailed histological or chemical examination was made and the nature of the pigmentation is not known.—E. G. WHITE.

I. BERTRAND, I., CARRÉ, H., & LUCAM, F. (1937). La tremblante du mouton. [**Scrapie in Sheep**].—*Rec. Méd. vét.* **113.** 540-561.

II. BERTRAND, I., CARRÉ, H., & LUCAM, F. (1937). La tremblante du mouton. [**Scrapie in Sheep**].—*Ibid.* 586-603. 5 figs. [Numerous refs.]

I. A review of the literature and present knowledge of scrapie.

II. Despite their failure to transmit the disease by inoculation of material from infected animals or by contact in the field, the authors consider that the cause is an infective agent. They base their conclusions on the symptoms and pathological findings which lead them to reject the possibility of the disease being caused by absorption of toxins or by hereditary factors.—P. S. W.

AJELLO, P. (1937). Beitrag zum Studium der melanotischen Tumoren bei dunkelhaarigen Pferden. [**Melanotic Tumours in Dark Haired Horses**].—*Wien. tierärztl. Mschr.* **24.** 513-523. 1 fig. [Numerous refs.]

Following a discussion of the terminology and classification of melanotic tumours in human and comparative pathology, A. deals briefly with previous records of these tumours in domestic animals.

In dark haired horses, melanotic tumours are very rare, only 20 recorded cases being found in the literature. Three new cases are recorded, chiefly because of the unusual situation of the tumours – skin of fetlock, inguinal region, and superficial cervical lymph node. The three animals were respectively a chestnut mare, and two chestnut geldings. Histologically, the tumours were sarcomata.

Of the various theories advanced in explanation of the origin of melanotic tumours, A. favours the view that they may develop in situations in which melanin is normally absent and are due to hypofunction of the chromaffine system, in particular, of the adrenals.—E. G. WHITE.

WILMES, H. (1937). Zum Vorkommen der Adenomyosis uteri bei Haustieren. [**Adenomyosis of the Uterus in Domestic Animals**].—*Dtsch. tierärztl. Wschr.* **45.** 385-387. 3 figs. [13 refs.]

After a brief discussion of the few records of cases of adenomyosis of the uterus of domestic animals, W. describes a case in a ten-year-old Alsatian dog. The body of the uterus and both horns were diffusely thickened. In addition, the left uterine horn showed a leiomyoma. The mucosa was enormously thickened and showed histologically numerous cysts lined by columnar epithelium; similar cysts were present throughout the wall of the uterus. The muscular coat was composed of irregularly arranged bundles of plain muscle fibres.

A tumour-like mass on the external surface of the uterus of a cow consisted of irregularly arranged plain muscle fibres and cysts lined by columnar epithelium.

Using the nomenclature employed in human pathology, the first case is classified as adenomyosis interna et externa, the second as adenomyosis externa.
—E. G. WHITE.

COOK, S. F. (1937). **A Study of the Blood Picture of Poultry and Its Diagnostic Significance.**—*Poult. Sci.* **16.** 291-296. 5 tables. [7 refs.]

C. has studied the normal values for erythrocytes, haemoglobin index, clotting time and differential counts in growing chicks, to determine what normal variations occur in these elements, and to what extent. The birds were reared in battery brooders, and blood samples taken from the age of four weeks onwards. The blood was diluted 1 : 200 with Toisson's fluid, for red and white corpuscle counts and Hellige's modification of Sahli's haemometer was used for haemoglobin estimations. The birds were divided into five lots of 10 birds each on different diets. On the third diet there was a slight anaemia, this diet being somewhat deficient in vitamins. The fourth diet which included casein showed the highest average haemoglobin percentage (68).

The findings agree with previous values given in the literature for White Leghorn chicks, and the article is a useful contribution to the literature on normal haematological standards in poultry, the tables being very full.—D. L. HUGHES.

GUISLAIN, P. (1937). Les pulpes de betteraves facteur de cachexie osseuse. [**Sugar-Beet Pulp as a Cause of Osteodystrophia in Cattle**].—*Thesis, Lyons.* pp. 82. [Numerous refs.]

A condition known as " maladie des pulpes " is extremely common amongst milking cattle in the north of France. It occurs towards the end of winter when the animals are housed, and is characterized by synovitis and arthritis of the limb joints, together with disinclination to rise and a certain amount of pica. Spontaneous fractures are very common. Lesions are confined to the skeletal system and consist of rarefying osteitis or generalized osteomyelitis, together with resorption of articular and intervertebral cartilage. G. considers that the disease is attributable to feeding on ensilaged sugar-beet pulp, which constitutes the basal diet of the cattle during winter. This pulp is extremely acid and devoid of vitamin D, and is usually deficient in calcium and phosphorus.—N. J. SCORGIE.

—. (1937). [Papers by COWELL, S. J., by CHICK, Harriette, by HARRIS, L. and by EDWARDS, J. T.] **Discussion on Nutrition and its Effects on Infectious Disease.**—*Proc. R. Soc. Med.* **30.** 1039-1052. 1 graph. [5 refs.]

The general impression obtained from the outlined evidence is that it is exceedingly difficult to prove definitely the relation of any particular food factor to resistance to infections in man. In discussing the relation of vitamin C to

infection the evidence is still inconclusive as to whether massive doses of the vitamin would help an adequately nourished subject once an acute infection had got hold, but it is generally agreed that deficiency of vitamin C reduces the resistance of g. pigs to infection.

The experiments on small animals described in this paper confirm the observations of others that F. & M. disease infection is most severe in well grown and well nourished animals and that they are in fact, most susceptible when they are in prime condition and at the prime of life.

The commonly held view, that low physical condition, such as that found in the under nourished, the very young, the old and sickly, makes them an easy prey to any current infection is not substantiated by the evidence presented in this contribution. The facts can be paralleled to some extent by experience with other diseases in veterinary medicine and pathology, for it is generally accepted that strong, well-grown young cattle are more susceptible to blackleg and anthrax than lean cattle, and perhaps in some infections of sheep, such as braxy, there is a similar tendancy.—R. Allcroft.

Svensson, S. (1937). Gikt hos hons. [**Gout in Fowls**].—*Skand. VetTidskr.* **27.** 381-412. 10 figs., 7 tables. [Numerous refs.] [English summary]. [Also published as *Medd. vet.-bakt. Anst. Stockh.* No. 147. pp. 32].

S. first gives a review of earlier work on gout in fowls and states that the disease is of some importance, as 5% and 12% respectively of the hens sent to two Swedish institutes for P.M. examination were found to have died from gout.

In series of experiments with different feeds, the uric acid of the hens' blood was determined periodically, and generally found to be about 2 mg. per 100 c.c. of blood. Attempts were made to produce the disease and a positive result is said to have been obtained after injection (intraven.) of 0·06-0·08 g. of aloin. High protein rations (of 15-20 g. dried egg-white or 100 g. of soya beans daily) considerably raised the uric acid content in every case, but did not produce demonstrable gout, and a diet consisting exclusively of wheat or potatoes did not even produce such a rise.

S. distinguishes between two types of the disease: one acute, seasonal in occurrence and most frequently attacking young hens, leads to death within a few days, and is by far the commoner; the other chronic (the so-called alimentary-visceral type), occurs at any time of the year, and attacks older hens. The latter is in all probability due to prolonged feeding on diets rich in proteins. The acute kidney type, on the other hand, is suggested to be due primarily to injury to the kidneys, presumably set up by cold and wet weather.—G. Naerland (Oslo).

Brion, A. (1936). Le syndrome azotémie. [**Azotaemia**].—*Rec. Méd. vét.* **112.** 449-460.

A general review, without fresh protocols, of conditions characterized by increase of non-protein nitrogen in the blood, chiefly urea. A brief discussion of uraemia in nephritis is followed by consideration of extra-renal causes, oliguria associated with circulatory disturbances, excessive protein feeding, excessive catabolism of body proteins, loss of hydrochloric acid by vomiting causing fall of blood chloride, associated with retention of urea to maintain osmotic pressure.

Symptomatology in the dog is described. In diagnosis a determination of blood urea by the simple hypobromite method is definitive, preferably associated with a determination of blood chloride. Therapy depends upon successful diagnosis of the underlying cause.—H. H. Green.

HARVEY, F. T. (1936). **Hyposodaemia.**—*Vet. Rec.* **48.** 1083-1084. [6 refs.]

A useful general article speculating upon the veterinary significance of sodium in relation to the medical problems raised by MCCANCE [*V. B.* **6.** 824].

—H. H. GREEN.

ZIMMERMANN, H. M., COWGILL, G. R., & FOX, J. C., Jr. (1937). **Neurologic Manifestations in Vitamin G (B_2) Deficiency. An Experimental Study in Dogs.**—*Arch. Neurol. Psychiat., Chicago.* **37.** 286-306. [Copied *verbatim* from *Physiol. Abstr.* **22.** 807. Signed D. P. C. LLOYD].

In 12 of 15 dogs maintained on a vitamin B_2 deficient diet there was progressive loss of weight, vomiting and bloody diarrhoea, muscular flaccidity, incoordination, and decrease in deep reflexes followed by death. Minimal doses of liver extract permitted the more gradual development of neurological symptoms, preventing the acute manifestations. The lesions histologically were demyelinisation of the peripheral nerves and degeneration of axis cylinders, destruction of medullary sheaths and axis cylinders in the posterior columns, and gliosis. The condition differed from canine black-tongue, which occurs on the Goldberger diet.

BUTOZAN, V., & TRAMER, E. (1937). Odredivanje sadržaja kalcijevih (Ca) i hlorovih (Cl) iona u krvnom serumu i mokraći kod goveda sa i bez hematurije. [**Calcium and Chlorine Ions in the Serum and Urine of Cattle with Chronic Haematuria**].—*Vet. Arhiv.* **7.** 371-376. [3 refs.] [German summary].

The calcium and chlorine contents of serum and urine obtained from cattle affected with haematuria were similar to those from cattle without haematuria. Therefore, the authors cannot support SCHLEGEL's opinion that haematuria is due to a diminution of the blood calcium content.—B. OSWALD (SPLIT).

PUBLIC HEALTH.

SCHERN, K. (1936). Zur Theorie und Praxis der SGR. (Schern-Gorlische Reaktion für Milch). [**The Schern-Gorli Ring Test**].—*Berl. tierärztl. Wschr.* **52.** 81-84 and 97-100. [Numerous refs.]

Discusses experiences with the Schern-Gorli test since its inception in 1930. A modification consists in adding one drop of 2% suspension of g. pig red corpuscles in saline to 2 c.c. of milk, and maintaining at about blood temperature for two hours. With pasteurized milk the corpuscles settle out as a red deposit. The presence of any considerable amount of raw milk is sufficient to form a reddish ring in the risen cream. The theory is that ring formation is a balance between entanglement of corpuscles in rising fat globules and rate of sedimentation of agglutinated corpuscles. Pasteurization alters the character of the fat globules and allows complete deposition of corpuscles.—H. H. GREEN.

HARDING, H. A. (1936). **Epidemics due to Raw Milk in Illinois.**—*Bull. Dairy Res. Bur. Mich.* **15.** 57-60.

This bulletin, issued by a company presumably interested in educating the public to the need for the pasteurization of milk, contains particulars of five recent outbreaks said to be spread by the agency of raw milk or ice-cream.

Three outbreaks of typhoid occurred; in two there were 36 cases with one death, whilst in the other there were twelve cases with three deaths. In the latter outbreak all save three were children.

Another outbreak of approximately 25 cases was designated "food poisoning" and the fifth was scarlet fever with 164 cases ; 80% of those which occurred during the peak period received unpasteurized milk from one dairy. "Laboratory tests on samples of milk drawn from cows in the herd of the producer revealed the presence of scarlet fever organisms. It is presumed that the udders of some of the cows were infected with germs carried by the milkers".

It is stated that from 70-75% of milk-borne epidemics are typhoid. "This is largely because typhoid cases are often not recognised as such for some weeks".

[The percentages given are not in accordance with figures published by the U.S. Public Health Services. Also it would appear that the evidence incriminating milk is frequently purely circumstantial]. "While the investigation failed to identify definitely the source of the contamination, the weight of evidence indicated that milk was responsible for spreading the disease".—H. E. Bywater.

I. Wilson, G. S., & Maier, Irene. (1937). **The Nutritive Value of Raw and Pasteurized Milk for Mice.**—*J. Dairy Res.* **8.** 203-217. 8 tables. [11 refs.]

II. Wilson, G. S. (1937). **The Resistance to Infection with** *Bact. typhi-murium* **of Mice Fed on Raw and Pasteurized Milk.**—*Ibid.* 218-223. 2 tables. [3 refs.]

I. From a large number of experiments conducted over a period of four years it was impossible to draw any definite conclusions as to the relative nutritive value for mice of raw and pasteurized milk, since it was observed that assessment of the nutritive value depends so much on the actual technique used in supplying the milk to the mice, as, if there is a difference, it must be extremely slight. Preliminary experiments did show, however, that so far as mice are concerned, cows' milk is deficient in mineral substances, and in some factor, possibly vitamin B, which is required for successful lactation.

II. In a series of experiments a comparison was made between the resistance to infection of 551 mice fed on raw milk and 495 mice fed on pasteurized milk, each dietary being supplemented by a mineral mixture and a white-flour biscuit. In one set of experiments the mice were inoculated (intraperit.) with about 100 to 1,000 living *Salmonella typhi-murium* and observed for a fortnight ; in another set they were fed by the mouth with about 100-200 million living bacilli and observed for four weeks. All animals were bacteriologically examined for evidence of the specific infection. The results showed no evidence that mice fed on pasteurized milk differ from those fed on raw milk in their resistance to infection with a natural parasite such as *S.t.-m.*—R. Allcroft.

I. Harding, H. A. (1937). **Pasteurization Test Useful in New York.**—*Bull. Dairy Res. Bur. Mich.* **16.** 117-120.

II. Harding, H. A. **Milk Borne Epidemics Reported in 1936.**—*Ibid.* 129-132 and 133-136. 4 tables.

I. Seventy-five cases of gastro-enteritis occurred in two camps 1-2 hours after a meal at which alleged pasteurized milk from a common source was consumed, about half the persons taking the milk being affected. The suddenness of the outbreak, the fact that there were no fatalities and that the symptoms lasted, on an average, for only 2 hours was attributed to toxins in part of the milk supplied. Owing to a faulty utensil at the pasteurizing depot unlabelled raw milk was placed alongside pasteurized milk. A small quantity of the milk responsible for the outbreak was available and this was shown by the phosphatase test, not to have

been pasteurized. It contained *Bact. coli* and haemolytic streptococci. Examination of the herd producing the milk revealed six cows with mastitis – " pus " being present in the milk of one of these cows.

Samples of the milk from these cows contained organisms similar to that found in the milk previously tested. [The evidence given to support the conclusions arrived at cannot be said to be conclusive].

II. An account of the milk-borne epidemics in the U.S.A. compiled from a report by the U.S. Public Health Services. There were 42 outbreaks and in each the milk used was unpasteurized. 15 were due to typhoid, 12 to scarlet fever, 6 to septic sore throat and 4 to undulant fever. Other outbreaks were classed as gastro-enteritis, enteritis, food poisoning and paratyphoid. 971 persons contracted scarlet fever (16 deaths), 268 cases with 7 deaths were attributed to septic sore throat, and there were 95 cases with 5 deaths from typhoid. No other fatalities occurred. One outbreak of septic sore throat was caused by milk also implicated in an outbreak of scarlet fever and there is reason to believe that some confusion in the differential diagnosis of these two diseases may arise. There has been a marked decline in the incidence of typhoid during the last decade.—H. E. B.

Stähl, S. (1937). En tuberkulosepidemi förorsakad av mjölksmitta. [**An Epidemic of Tuberculosis Caused by Milk Infection**].—*Nord. med. Tidskr.* **13.** 121-125. 1 fig., 2 charts.

S. reports a crop of cases of TB. in children in a rural district of Sweden during the autumn months of 1936. Fifty cases were recorded of which 25 were serious. In all cases the source of infection could be traced back to a herd supplying the district with milk and which included a cow found to be infected with udder TB. The herd had been subjected to occasional clinical examination. The author emphasizes that a clinical inspection alone will not prevent tuberculous milk from being distributed for human consumption.—Gustav Naerland (Oslo).

Ida, K. (1936). **Some Chemical Properties of Various Kinds of Milk and the Detection of Tubercle Bacilli in Milk.**—*J. publ. Hlth Ass. Japan.* 1-5. [Abst. from abst. in *Bull. Hyg., Lond.* **12.** 294-295].

Of 76 samples of milk examined for tuberculosis one was positive by the cultural method and five by g. pig inoculation; they all came from raw milk samples except one which was an inefficiently pasteurized sample.

—. (1936). **Food Poisoning at Enfield, White County.**—*Bull. Mich. Dairy Res. Bur.* **15.** No. 15. [Copied *verbatim* from *Bull. Hyg., Lond.* **11.** 786].

A small outbreak of food poisoning caused by the consumption of milk from cows with infected udders occurred during July at Enfield. The milk, obtained from three cows kept for family use, and ice cream made from the milk were consumed by neighbours who suffered from food poisoning several hours later. Similar food poisoning outbreaks have been reported from New York State. An examination of the cows showed that their udders were infected with bacteria of the staphylococcus variety and their milk contained large numbers of these bacteria.

Maternowska, Irena. (1937). Wykrwawianie swin po oszołomieniu elektrycznym i mechanicznym. [**Bleeding of Pigs after Mechanical and Electrical Stunning**].—*Hig. Prod. Zwier.* **2.** 38-40. 1 table, 2 graphs. [1 ref.] [Suppl. to *Wiad. weteryn.* **16**].

Comparative tests were made on 110 bacon pigs, some being stunned with a hammer and some by electric current. It was found that the former did not

bleed so well as the latter. Blood obtained from the former being equivalent to 2·67 % of the body weight and that of the latter 3·14 %.

The electrical apparatus used was of the Lauterschmidt-Weinberg type using an alternating current at 45 volts.—A. Szwabowicz (Lwów).

THERAPEUTICS.

Mlinac, F., & Oswald, B. (1937). Prilog poznavanju delovanja Acaprin-a (Beyer) na prívídno zdrave naše ovce. [**The Action of Acaprin on Healthy Sheep**].—*Jugoslov. vet. Glasn.* **17.** 7-12. 2 figs., 2 tables. [14 refs.] [English summary].

Because of deaths caused in sheep by acaprin, the authors investigated its action. Preliminary experiments were carried out on rabbits and g. pigs and were continued on sheep with the following results :– 21 ewes were given intramuscularly, maximum therapeutic doses of acaprin as stated by the makers, and one died. Four ewes received double maximum therapeutic doses, and three succumbed.

[It seems worth noting that the makers have since issued a new publication recommending a considerably smaller dose for sheep].—B. Oswald (Split).

Allott, A. J. (1937). **The Treatment of Bovine Mastitis with Sulfanilamide.**—*J. Amer. vet. med. Ass.* **91.** 588-596. 3 tables. [5 refs.]

In this preliminary account A. describes experiments carried out on three cows suffering from advanced acute mastitis. Sulphanilamide was given in a capsule in doses of 30 g., and later 60 g., twice a day. In all cases a marked improvement was observed during treatment, and continued for a few days after treatment; cell and streptococcal counts in milk samples were speedily reduced, and the quality of the milk much improved. Detailed tables are given. The author recommends 30 g. four times a day where possible, and strongly urges the extension of this treatment to early acute cases.

Lagos, J. S. M. (1937). O emprego do hg soluvel no tratamento das myases. [**Treatment of Myiasis by Intravenous Injections of Mercuric Oxycyanide**].—*Bol. Soc. brasil. Med. vet.* **7.** 96-98.

Following the successful treatment of nasal myiasis in man by intravenous mercuric oxycyanide, L. used a colloidal solution of the oxycyanide containing 47 % of metallic mercury, with the addition of suitable pharmaceutical substances (not specified).

2 cg. of this solution (intraven.) for sheep of average weight destroyed all dipterous larvae in the head within 24 hours. [Presumably not suggested seriously as a reasonable method in practice].—J. A. Pasfield.

I. Hoenig, J. (1936). Vergleichende Untersuchungen über die Wirksamkeit einiger Derrispräparate bei der Dasselbekämpfung des Rindes. [**Value of Derris Against Ox Warbles**].—*Inaug. Diss., Berlin.* pp. 39. 5 tables. [17 refs.]

II. Jänel, H. (1936). Ueber die anthelminthische Wirkung des Rotenons. [**Anthelmintic Action of Rotenone**].—*Inaug. Diss., Berlin.* pp. 37. 2 tables. [Numerous refs.]

I. Extensive experiments were undertaken to test the usefulness in the field of some proprietary derris preparations. The work was carried out in East Prussia from March to May on 534 cattle bearing 7,609 discoverable larvae in their second

or third stage of development. Most of the animals were one or two years old and each was treated under comparable conditions. A single application of 10% "abdassol" killed 95·6% of the larvae; 4% solution of "derrilavol" killed 76·8%; 10% solution "derrisol" killed 91·5% and 4% solution of "panderran" killed 83%. Because of its ease of application, its lathering properties, its cheapness, its harmlessness as well as its potency as an insecticide, "abdassol" is to be preferred. "Derrisol" is somewhat expensive. The results obtained by GÖTZE and others in Hanover with "derrilavol" were not confirmed. Treatment is practically useless if undertaken too early in the year.

II. When 5 g. rotenone, dissolved in 30 c.c. chloroform and mixed with 250 c.c. linseed oil, was given to each of 20 horses by means of an oesophageal tube it had no marked vermicidal action as judged by the count of strongyle eggs in the horses' faeces. No difference was found when the number of horses were treated with a like amount of rotenone and linseed oil, without chloroform. The dose had no ill effect on the horses, nor was any ill effect shown by horses and g. pigs following the subcut. injection of 0·04 g. rotenone per kg. of body weight.—G. W.

I. VELU, H., & ZOTTNER, G. (1936). Traitement de la strongylose pulmonaire du mouton par les suspensions aqueuses de pyréthrines. [**Treatment of Pulmonary Strongylosis in Sheep with Aqueous Solutions of Pyrethrine**]. —*C. R. Acad. Agric. Fr.* **22.** 517-522. [6 refs.]

II. VELU, H., & ZOTTNER, G. (1937). Les pyréthrines et la prophylaxie de la strongylose pulmonaire. [**Pyrethrine in Treatment of Pulmonary Strongylosis**].—*Bull. Acad. vét. Fr.* **10.** 53-58. [6 refs.]

I. Pyrethrine, if suspended in water in the proportion of 1 : 100, forms a stable, effective, cheap agent for the destruction of *Dictyocaulus filaria* in the bronchi of sheep. Being freely miscible with mucus, it comes into direct contact with the parasite. It should be given through a gum-elastic tube introduced through the nose to the region of the pharynx, the animal being held in the sitting-up position with its body inclined slightly backwards. After the injection the sheep is kept lying on its back for a few seconds. It has been demonstrated that, even if a nasal tube is used, the dose will not reach the bronchi if the animal is in the standing position.

II. This is a report on the result of the treatment of sheep as described in I. The treatment has been extensively used in Morocco. A single injection is sufficient for light infestation but, for heavy ones, three doses may be required. It is harmless to the host, and its curative effects are very soon apparent.—G. WILLIAMSON.

SCHWARTZ, B., & PORTER, D. A. (1937). **Tests with Hydrogen Peroxide as an Anthelmintic.**—*Rev. Med. Trop. Parasit., Habana.* **3.** 11-24. [Copied *verbatim* from *Trop. Dis. Bull.* **34.** 876. Signed C. L.]

The tests were carried out on white rats and on dogs.

The experiments were undertaken *in vivo* from the conviction that "no reliable conclusions regarding anthelmintic efficacy can be drawn from tests *in vitro*". In rats the infection was one with *Nippostrongylus muris* 6 to 8 days old, the drug was given through a catheter passed down the throat as far as possible under light anaesthesia and the rats faeces were examined during their life and the intestines after they had been killed. The rats weighed about 150 grams and were given 3 to 4 c.c. of a 0·5 to 1·5 per cent. solution of hydrogen peroxide. After a 0·5 per cent. solution the percentages of worms passed compared with the total recovery were 1·8 to 2·1; after a 1 per cent. solution, 45·5 from 3 c.c. and 60·8 and 63·3 from 4 c.c.; after a 1·5 per cent. solution, 51·5 to 93·3 from 4 c.c. Three

pups 32 days old, weighing about 2 kilos, were given two treatments of 2 oz. [say 60 c.c.] each of a 1·5 per cent. solution, and passed, of the *Toxocara canis* they harboured, 85·7, 90 and 100 per cent., and of *Ancylostoma caninum* 0, 37·5 and 50 per cent.; their three litter mates, at 46 days old, were given one such treatment and passed, of *T. canis* 64·8, 94·1, and 100 per cent., and of *A. caninum* 33·3, 42·9 and 100 per cent. To three full grown dogs 6·2 to 8·4 kilos were given 2 oz. of the 1·5 per cent. solution once; the percentage efficacy for *A. caninum* was 0, for *T. canis* 100, for *Toxascaris leonina* 16·7 and 83·3, for *Dipylidium caninum* 0 and 0.

[Seeing that a 3 per cent. solution of H_2O_2 evolves ten times its volume of O_2, it will be realized that if the weaker solutions used here were given to man weight for weight, the figures got from the rats would mean for him a dose of from 400 to 1,600 c.c. of water, with a prompt escape of 666 to 8,000 c.c. of oxygen into stomach or duodenum, or both; from the younger puppies the comparative figures for man would be 1,800 c.c. of fluid and 9,000 c.c. of evolved oxygen, a total of nearly 11 litres of suddenly added contents].

Baudet, E. A. R. F. (1937). Over enkele geneesmiddelen tegen ascaridiosis bij duiven. [**Treatment of Ascaridiasis of Pigeons**].—*Tijdschr. Diergeneesk.* **64.** 113-121. 3 tables. [English, French and German summaries].

Various medicaments advocated as vermicides were tried on pigeons infected with *Ascaridia columbae* and *A. capillaria.* It appeared to be necessary to starve the pigeons beforehand as many vomit after the administration of drugs especially when the crop is still filled. The most effective anthelmintics against *A. columbae* were - oleum chenopodium (3-6 drops in castor oil), and carbon tetrachloride (0·25 c.c.). None of these medicaments had any effect upon *A. capillaria.*

—C. Bubberman (Schiedam).

Mangold, E., & Damköhler, H. (1936). Versuche über die Wirkung der Holzkohle bei der Kükenaufzucht sowie auf die Verdauungsfunktionen und Futterausnutzung des Geflügels. [**Action of Wood Charcoal on the Digestive Function of Fowls**].—*Arch. Geflügelk.* **10.** 289-316. 1 fig., 11 tables. [17 refs.]

Wood charcoal was found to be effective in arresting diarrhoea in hens and for this purpose the size of the charcoal particles was unimportant, as even large lumps are ground to powder in the gizzard. Hens voluntarily ingested wood charcoal to the extent of 1·8 g. per day (1·5 % of the daily intake of food). It was found to have no influence on the food utilization or growth of fowls and no reduction in the rate of the passage of food through the alimentary canal occurred while charcoal was being given. It appeared to increase the digestibility of nitrogen-free substances and organic substances by 3·8 % and of rough fibre by 5·26 %.

—G. Hartmann (Vienna).

POISONS AND POISONING.

Gaud, M. (1937). Méthodes employées au Maroc pour la destruction des sauterelles et accidents causés au bétail et à l'homme par l'emploi des produits toxiques. [**Poisoning in Man and Animals by Toxic Substances used in the Destruction of Locusts**].—*Bull. Off. int. Hyg. publ.* **29.** 977-991. 1 table, 2 maps.

An arsenical preparation spread in the form of a powder over pastures which

were the breeding places of locusts was found to be very effective in destroying the larvae. Losses from arsenical poisoning amongst cattle and sheep grazing on the pastures were small in relation to the area treated. The losses which did occur were attributable to defective spreading of the preparation, excessive concentrations of arsenic having been left in certain spots.—N. J. SCORGIE.

I. POLEY, W. E., MOXON, A. L., & FRANKE, K. W. (1937). **Further Studies of the Effects of Selenium Poisoning on Hatchability.**—*Poult. Sci.* **16.** 219-225. 2 plates, 4 tables, 3 charts. [4 refs.]

II. POLEY, W. E. (1937). **Alkali Disease.**—*Rep. S. Dak. agric. Exp. Sta., 1936.* p. 37. 1 table.

III. MOXON, A. L. (1937). **"Alkali Disease" or Selenium Poisoning Project.** —*Ibid.* pp. 15-19. 1 table. [12 refs.]

I. A group of White Leghorn birds was fed on a normal ration, including cereals from non-seleniferous areas, for six weeks, during which time records were kept of egg-production, fertility and hatchability. The group was then subdivided into :– (a) those kept on the same ration, serving as controls, (b) those receiving a ration containing seleniferous grains equivalent to 15 p.p.m. Se, and (c) those receiving this toxic ration to which 1% Se was added.

During the next five weeks there was no impairment of egg production and fertility, although food consumption, live weight and egg size decreased in groups (b) and (c). No normal chicks hatched after the seventh day of feeding the Se-containing grain, but six days after restoring the normal ration the toxic effects of Se on embryo development and hatchability had disappeared. The monstrosities among the embryos were characteristic of Se poisoning and did not appear in the control group. The addition of sulphur to the ration failed to affect the action of selenium.

II. A brief résumé of I.

III. [This article consists of a report of the various contributions made to the knowledge of the biochemistry and physiology of Se from the above station]. Se : S ratios have been found to be moderately constant in different parts of given plants and also in different proteins from given cereals. Preliminary bio-assays of organic Se compounds revealed great differences in toxicity. A Se-containing amino-acid has been synthesized and studies of this compound may suggest a probable explanation of the toxic action of certain Se compounds. Diets containing more than 9 p.p.m. Se as occurring in cereals are toxic to young rats, 5 p.p.m. causing depression of growth. Se in cereals is more toxic than that in organic salts.

Injection of Se causes dehydration of blood due to an accumulation of dropsical fluid in the thorax and abdomen, death being due to blood stasis. The M.L.D. of As, Se, Te and V in various forms has been determined for the rat. Certain peptones and proteins protect yeast enzymes from the toxic action of Se. Analysis of the organs of dogs fed on Se-containing cereals revealed an accumulation of Se in the liver, kidneys and spleen, with very little in the muscle. The addition of Se to the soil is ineffectual in producing the absorption of Se by plants.—A. EDEN.

SMITH, M. I., STOHLMAN, E. F., & LILLIE, R. D. (1937). **The Toxicity and Pathology of Selenium.**—*J. Pharmacol.* **60.** 449-471. 1 fig., 10 tables. [11 refs.]

Three mg. of selenium per kg. body weight is acutely toxic for the rat whether given as selenate or selenite. The oral M. L. D. is about the same for the rabbit, but intravenously 1·5 mg. Se per kg. as sodium selenite is toxic as against 2-2·5 mg. per kg. as sodium selenate. Continuous small doses of Se are cumulative and

there is no evidence of acquired tolerance. Chronic toxicity varies with the species and with different individuals of the same species, the rat being the most resistant and the cat the most susceptible of the species examined. The lesions produced in chronic Se poisoning vary, being most marked in the stomach, liver, and blood forming organs and least marked in the kidney and heart. Chronic Se poisoning thus appears most likely to affect gastric and hepatic functions and may possibly also cause disturbances of the haematopoietic organs.—ALFRED EDEN.

BISSET, N., & REES, J. (1937). **Poisoning by Ragwort.**—*Welsh J. Agric.* **13.** 321-325.

Three separate outbreaks, involving the deaths of 29 cattle, of poisoning from ragwort (*Senecio jacobaea*) in hay are recorded. Characteristic symptoms, in order of appearance, were unsteadiness of the hind legs, diarrhoea, severe straining sometimes resulting in eversion of the rectum, and delirium resulting in death about 4 days after onset of the straining. P.M. findings regarded as typical were large quantity of bile in gall-bladder, yellow cirrhotic liver, and thickened lining of abomasum. Symptoms were observed after 4-8 weeks in two of the outbreaks, and only after 5 months in the third. Methods for destroying ragwort on the pastures are suggested.—N. J. SCORGIE.

TAUBE, H. N., & ESSEX, H. E. (1937). **Pathologic Changes in the Tissues of the Dog Following Injections of Rattlesnake Venom.**—*Arch. Path.* **24.** 43-51. 2 figs. [Numerous refs.]

After referring to previous literature on the subject, the authors detail the changes in the tissues of dogs following injections (intraven.) of lethal doses of crotalin. A histological examination was made of portions of all parenchymatous organs, and of various levels of the brain and spinal cord.

The symptomatology and pathology in the test animals are described. There were petechial haemorrhages involving most mucous membranes; the organs in both body cavities showed petechial or diffuse haemorrhages, especially immediately under the serous membranes; severe haemorrhage was often observed in the small intestines, blood remained fluid in the heart and veins; most organs appeared congested except the spleen, which was contracted and slate-grey. Crotalin acts as a cytolysin for endothelial cells of blood vessels. The effects of crotalin poisoning are likened to those produced by certain types of shock.—C. V. WATKINS.

PHYSIOLOGY.

I. FRENCH, M. H. (1937). **A Further Examination of the Blood of Cattle of the Bukoba District. [Phosphorus and Haemoglobin].**—*Rep. Dep. vet. Sci. Tanganyika, 1936.* pp. 41-43. 1 table.

II. FRENCH, M. H. (1937). **A Blood Survey of the Cattle of the Musoma District.**—*Ibid.* pp. 44-48. 1 table.

III. FRENCH. M. H. (1937). **The Blood Analyses of Musoma Stock in Bukoba and Bukoba Stock in Musoma.**—*Ibid.* pp. 49-50. 1 table.

IV. FRENCH, M. H. (1937). **A Blood Survey of the Native Stock of the Singida District.**—*Ibid.* pp. 51-52. 1 table.

I. Confirmation is given that the slow growth and reproduction rates of the Ankole cattle in the Bukoba district are not due to shortage of phosphorus, whilst the slight degree of anaemia is also not a contributing factor. These Ankole cattle although living in a mountain grassland area do not fare so well as the Zebu animals

over the rest of the Territory. It is suggested that this is due to inefficient herding, poor quality grazings, heavy tick infestation and recurrent attacks of East Coast fever.

II. The blood inorganic phosphorus figures for the Zebu cattle of the Musoma district indicate that there is no shortage of phosphorus in the grazings, whilst the haemoglobin levels appear to be correlated with the amount of green grazings and the strain of growth and reproduction.

III. A reciprocal transfer of stock from these two districts showed that the animals transferred developed haemoglobin and blood inorganic phosphorus levels similar to those found in the local breeds. The fact that the Ankoles did well in Musoma and the zebus did badly in Bukoba is a further confirmation that the Bukoba conditions are responsible for the poor rates of growth and reproduction in the Ankole breed of that district.

IV. Low inorganic blood phosphate figures accompanied by a slight nutritional anaemia characterize the stock from an overgrazed and overstocked area of this district. Values approaching those reported for the phosphorus-deficient areas of South Africa were encountered in cows which had undergone the strain of several pregnancies.—S. A. Evans.

Apostoleanu, E., & Vladutiu, O. (1936). Le lymphoganglion testis proprium (nobis) du porc. [**Testicular Lymph Nodes in the Pig**].—*Arhiva vet.* **28.** 161-165. 6 figs. [15 refs.] [In French].

On studying the lymphatic system of the genital region of the boar, a testicular lymph node was found to be present in some 80% of the animals examined. It was usually situated on the spermatic cord about two inches from the testicle and varied from the size of a small pea to that of a hazel nut. It was not found in either the stallion, bull, ram, dog or rabbit.—A. Robertson.

Lesbouyries, Berthelon, & Hennion. (1937). La folliculinurie chez la vache. [**Folliculinuria in the Cow**].—*Bull. Acad. vét. Fr.* **10.** 261-265. [Copied *verbatim* from *Vet. Rec.* **49.** 1566. Signed N. J. S.]

Confirmation is given to the results obtained by the majority of workers on this problem, that the excretion of folliculin (oestrin) in the urine of the pregnant cow is relatively small compared with the amount excreted by primates and equidae. Moreover, it is subject to great variation at the different stages of pregnancy. The authors were not able to detect the hormone in the urine of empty cows, cows on heat, or nymphomania cows. In the last mentioned the liquid contained in the ovarian cysts was, however, relatively rich in folliculin – at least 1,000 R.U. per litre.

Marais, I. P. (1936). Untersuchungen über den Sexualzyklus bei Merinoschafen. [**Sexual Cycle of Merino Sheep**].—*Inaug. Diss., Leipzig.* pp. 53. 5 figs. on 5 plates, 2 tables, 3 graphs. [Numerous refs.]

From a 12 months study of merino sheep in South Africa, M. found that oestrus lasts for an average of 39·8 hours and that the length of the oestral cycle is 15-24 days with an average of 17·45 days. Three periods of intense oestrus occur between November and July (in summer, autumn and winter). The cycle in uninfluenced by climate, constitution or green food. It was found that lutein cells of the corpus luteum are derived from transformation of the granular cells of the follicle. It is also possible for special cells of the theca to be transformed into lutein cells. There is a distinction between lutein cells of the corpus luteum of pregnancy in sheep and those in sheep which are not in-lamb. In the latter,

lutein cells at different stages of development are to be seen, whilst in the former only one type of cell is observed. Towards the end of gestation lutein cells give place to spindle-shaped cells.—G. HARTMAN (VIENNA).

SULMAN, F. (1937). **Does the Gonadotropic Hormone induce Antibodies or Antihormones?**—*J. exp. Med.* **65.** 1-14. 5 tables. [Numerous refs.]

The fact that the effect of prolan on the ovaries diminishes and finally ceases with frequent applications has been attributed to antigenic properties. S. shows in experiments on 52 rabbits, that purified gonadotropic hormone, either in the form of prolan from urine of pregnant women or of prosylan from blood of pregnant mares, has no antigenic effect and attributes earlier deductions to confusion with non-specific urine antigen.

Sera of rabbits containing abundant prolan antihormone contain no antibodies against prolan and hence antihormones against gonadotropic substances must be regarded as "protective ferments" in ABDERHALDEN'S sense. The absence of immunizing-effective components in pure prolan and prosylan precludes their use by the diagnostician for serological diagnosis of pregnancy, but protects the therapeutist against undesirable toxic or allergic secondary effects in intensive treatment.—J. A. NICHOLSON.

TECHNIQUE.

ALEXANDER, L., MYERSON, A., & GOLDMAN, D. E. (1937). **The Mineral Content of Various Cerebral Lesions as Demonstrated by the Microincineration Method.**—*Amer. J. Path.* **13.** 405-440. 50 figs. on 16 plates. [Num. refs.]

Sections of brain fixed in absolute alcohol and formalin and embedded in paraffin were cut at 4μ and exposed to temperatures gradually rising to 650°C. By this procedure the organic components of the section are burnt out and only the heat-resistant mineral constituents remain on the slide. Of the mineral elements only Fe, Ca and Si can be recognized with certainty by this method. The material examined consisted of sections taken from various regions of the brains from 40 human cases and from some experimental cats. Records of the observations made and the conclusions drawn from sections of normal and pathological brains are discussed in full in the text, to which the reader is referred for further details.—ALFRED EDEN.

CARRÉ, H. (1936). Coprologie du mouton. [**Faecal Diagnosis in Sheep**].—*Cah. Méd. vét.* **6.** 261-268. 16 figs.

A description is given of the appearance of the faeces of sheep in health and disease. C. states that derangements of the digestive tract play a great part in the development of sheep diseases and he claims that many disorders can be diagnosed by macroscopic examination of the faeces.—F. BLAKEMORE.

KANAZAWA, K. (1936). Mise en évidence des corpuscles de Paschen au cerveau et au testicule par la méthode de surcoloration. [**The Demonstration of Paschen Bodies in the Brain and Testicle by Staining**].—*Jap. J. exp. Med.* **14.** 85-86. 2 figs. on 1 plate. [8 refs.] [In French].

By the use of a slight modification of the Borrel-Paschen method of staining it is possible to demonstrate Paschen bodies (extracellular and intracellular), in the brain and testicular tissue of rabbits and mice artificially infected with vaccinia virus. The only difference from the original method of staining is the use of a

filtered solution of Loeffler's mordant to which has been added one sixth of its volume of glycerin. The best results are obtained when the tissue to be stained has been previously treated with a 1 : 100 solution of antiformin for several minutes.

—R. F. GORDON.

WALBUM, L. E., & REYMANN, F. E. (1937). Ein einfaches Verfahren zur Verminderung des Luftgehaltes an entwicklungsfähigen Mikroben in bakteriologischen Laboratorien, Operationsräumen u. dgl. [**A Simple Method of Reducing the Bacterial Content of the Air of Bacteriological Laboratories, Operating Theatres etc.**]—*Zlb. Bakt. I.* (*Orig.*). **139.** 193-200. 2 figs. [Copied *verbatim* from *Bull. Hyg., Lond.* **12.** 722. Signed J. C. CRUICKSHANK].

The authors describe in detail the arrangements by which they reduced greatly the bacterial content of the air of a room 102·4 c. metres in capacity in which certain bacterial procedures such as testing of sterility of sera and vaccines were carried out. The door was made to fit closely by rubber padding and the windows were sealed with the exception of one pane which was replaced by a cottonwool pad held in a wire gauze frame. Air was withdrawn from the room by an aspirator at the rate of 800 c. metres per hour. Sterilization of the air was carried out by means of the " Junker-tube ", which consists of a metal tube 2 metres in length mounted over a bunsen so that a constant large amount of air passes up the tube and is sterilized. The routine was to light the bunsen and start the aspirator at 7 a.m. and to swab down all apparatus with 0·1 per cent. sublimate. Three hours later the bunsen was turned out and the aspirator run for a further 1-2 hours. Precautions were taken against excessive carrying in of dust by the workers.

Bacterial counts before and after this technique was begun show that the number of organisms per c. metre of air in the room was reduced from the order of 2,500 to 80. The number of contaminations was likewise reduced to a negligible figure.

MISCELLANEOUS.

ANON. (1937). **A Review of Veterinary Research and Investigation in the Colonial Empire as at December 31, 1936.** pp. 29. London : Colonial Office. [fcp] [Mimeographed].

This review was compiled for the Colonial Advisory Council on Agriculture and Animal Health (Great Britain) from reports sent in by veterinary research officers of the Colonial Empire.

The present position with regard to the important prevailing diseases, their control and research, also notes on pastures and animal husbandry are briefly described for the following Territories :– Nigeria, Gold Coast, Tanganyika Territory, Kenya, Uganda, Nyasaland, Northern Rhodesia, Trinidad, British Guiana, Jamaica, Antigua, Leewards, Malaya, Ceylon, Mauritius, Hong Kong, Palestine, Cyprus, Malta and Fiji.—J. E.

—. (Oct. 1937). **Canadian Journal of Comparative Medicine. Vol. 1. No. 1.** pp. 36. Quebec : National Business Publications, Ltd.

With the appearance of this journal the veterinary profession in Canada has at last a periodical of its own. With a strong editorial board drawn from the most important veterinary institutions in Canada the publication will doubtless come to hold an important position among the medical periodicals of the world. In the

introduction the intention of making it truly comparative as between animal and human medicine is stressed. We welcome the newcomer heartily.

The periodicity is monthly.—J. E.

British East Africa. (1936). **Conference of Governors of British East African Territories. Conference on Co-Ordination of Veterinary Research. Held at Kabete 20th to 23rd January, 1936.** pp. 122. Nairobi: The East African Standard, Ltd. [8vo].

This opens with the Agenda of the Conference on the co-ordination of Veterinary Research in East Africa and a list of representatives who attended the meetings – then follows the main report of the proceedings, and finally, two appendixes, *viz* (1) programme of research – a list being given of the various subjects and the institutes at which they will be investigated during 1936, and (2) papers circulated to the Conference. These are dealt with separately in this *Bulletin*.

Animal Diseases.—The various representatives referred to the incidence of Bovine Contagious Abortion and Undulant Fever in the various Territories. Evans reported a case of apparent mutation from *melitensis* type to the *abortus* type. Daubney expressed the opinion that the incidence of undulant fever in man did not suggest that cows' milk was a real danger as a vehicle of infection. A programme of future research was confirmed.

Attention was drawn by Mettam to the high incidence of Tuberculosis in Ankole cattle – 70% reacted to the tuberculin test. A human strain has been isolated from sheep in Uganda. Cornell reported a low incidence of TB. in cattle in Wachagga, despite a high incidence of the disease among their owners. It was reported that TB. in cattle was not common in the Sudan.

Equine Abortion, Haemorrhagic Septicaemic and Anaerobic Infections are briefly referred to.

Investigations on the capacity of ticks other than *Rhipicephalus appendiculatus* to transmit East Coast Fever are being carried out. A new transmitter *Hyalomma aegyptium impressum* was found; transmission by *R. simus* and *R. evertsi* was confirmed – the disease could not be transmitted by *R. pulchellus* or *Amblyomma variegatum*. Discussion followed on the solidity of immunity after recovery from early infection and on the comparison of mortality rates among calves in different enzootic areas.

Mettam referred to his paper on "Turning Sickness" [*V. B.* **6.** 169]. He suggested that this disease is possibly a residual East Coast fever infection; Daubney had noted that "turning sickness" developed in a number of cases a relatively short time after recovery from E.C.F. This section ends with the programme of work approved in the various areas.

Brassey-Edwards outlined the recent history of Rabies in Kenya and stated that the position appears to be satisfactory, the policy of destroying animals responsible for the spread of rabies by strychnine baits being justified. Hudson referred to experiments with an etherized rabies vaccine and noted an apparent seasonal incidence of the disease in Kenya, cases being more numerous in the second half of the year. A similar seasonal incidence was also noted in the Sudan. Mettam and Hart reported the first cases diagnosed in Uganda, which were probably introduced from the Congo. Bennett reported the recovery of a virus in the Sudan which it was impossible to fix. Daubney stated that, among wild animals, infection seemed to be restricted to the jackal; there was no evidence to implicate the mongoose or genets as in South Africa. A number of resolutions dealing with research, control of the disease and diagnosis were passed.

In connexion with Rinderpest, Daubney dealt with the duration of immunity

conferred by inactivated vaccine and by treatment with vaccine virus, the possible plurality of strains of virus and intradermal vaccination. Discussion took place on the results obtained by the use of vaccine in Kenya, Tanganyika and Uganda. The question of eradication or control of rinderpest was dealt with and it was agreed that the policy in the East African territories should be eventual eradication. It was arranged that a co-ordination Committee should be set up to agree upon a common control policy in adjoining areas.

Vaccination with mouse-passaged neurotropic virus has superseded all other methods of inoculation against HORSE-SICKNESS in Kenya. FOTHERINGHAM reported on the results of his work to find a simpler and cheaper laboratory method of diagnosis.

Work by DAUBNEY on DENGUE FEVER suggested that animals are not susceptible.

The following virus diseases were also dealt with briefly. HEARTWATER (distribution of the disease), CONTAGIOUS CAPRINE PLEURO-PNEUMONIA (incidence, aetiology and transmission), BLUETONGUE, FOOT AND MOUTH DISEASE (comparative susceptibility of native and imported cattle), SWINE INFLUENZA (occurrence in Kenya and aetiology) and " Snotsiekte " (character of the virus and comparison with malignant catarrh of Europe).

The Conference recommended that further research work into the aetiology and control of CONTAGIOUS BOVINE PLEURO-PNEUMONIA should be carried out.

As regards MEASLES IN CATTLE AND PIGS, difficulties were experienced in promoting experimental infestation in cattle during work on immunization against *Cysticercus bovis*. In Kenya, inquiries indicated that measles in cattle is confined to those kept in the vicinity of homesteads. *Cysticercus cellulosae* only occurs in isolated districts and it was recommended that regulations should be formulated to check the general distribution of this parasite.

GENERAL.—Under Respiratory Diseases of Sheep a general discussion was opened by FOTHERINGHAM. It was stated that in Kenya both " JAGSIEKTE " of South Africa and PROLIFERATIVE PNEUMONIA associated with the presence of *Muellerius*, occurred. LAIKIPIA LUNG DISEASE still exists in Kenya with lesions as described by METTAM in 1928, but the organisms recoverable from the lesions are no longer the same. Caseous LYMPHADENITIS is more common than was formerly realized.

POULTRY DISEASES.—HUDSON reported a virus disease in Kenya which, as far as his experiments had gone, appeared identical with NEWCASTLE DISEASE.

MYCOTIC SKIN DISEASES.—The following conditions were discussed – (a) UASIN-GISHU DISEASES OF HORSES – two conditions at least appeared to be included under this name. (b) STREPTOTHRICOSIS – HUDSON stated that he recognized a similarity between the organisms of streptothricosis and the descriptions of those of the lumpy wool organism.

DANKS reported the occurrence of ONDIRI FEVER apparently not recorded before. Sheep and dogs are susceptible, but horses and pigs resisted inoculation. An account of the symptoms and pathology was given.

ANIMAL NUTRITION.—DAUBNEY reported on results of work on " SWEATING SICKNESS " in calves. It was recognized as similar to certain deficiency diseases, *e.g.* Pellagra, Sprue, etc. Good results in treatment were obtained with baker's yeast and with commercial liver extract prepared for treatment of pernicious anaemia in man. ANDERSON dealt with the relationship between nutrition and reproduction.

CO-ORDINATION OF VETERINARY RESEARCH.—This subject was discussed and then referred to a co-ordination Committee with powers to make recommendations

as to exactly what form the proposed co-ordination should take.—J. C. WALLACE.

I. TURCO, V. (1937). L'élevage du bétail à Kerekere. (Ferme des mines d'or de Kilo-Moto). [**Livestock Rearing at Kerekere, Belgian Congo**].—*Bull. agric. Congo belge.* **28.** 69-99. 10 figs., numerous tables.

II. BOUVIER, G., & BOUVIER, S. (1937). Aperçu sur l'élevage bovin dans la Province du Lomami-Kasaï (Congo belge). [**Cattle Rearing in Lomami-Kasai Province (Belgian Congo)**].—*Schweiz. Arch. Tierheilk.* **79.** 73-81 and 121-129. 2 figs. [Numerous refs.] [In French].

In these two articles descriptions of cattle rearing under tropical conditions are given.

I. Kerekere is situated at an altitude of 1,350 m. with a temperature range of 14°-33°C. Wet and dry seasons are well marked, the latter lasting from December to March. The natural savannah herbage is insufficient to support cattle, but burning and cutting result in the growth of young and better grasses sufficient to maintain the indigenous cattle. Imported breeds are housed in open byres and receive supplementary rations such as maize, beetroot, etc., which are grown locally. Livestock improvement is carried out by crossing the two native breeds, Lugwaret and Bahema, with Friesians or dairy Shorthorns imported from Kenya. Details are given regarding the increase in size and in milk yield of the crosses. First crosses are extremely resistant to disease, but excessive concentration of improved blood leads to weakened resistance. Losses from trypanosomiasis and piroplasmosis have been almost eliminated by appropriate measures. Losses from other causes are not unduly high.

II. Lomai-Kasaï is a well-wooded region containing numerous rivers separated by wide plateaux which constitute the grazing grounds of the cattle. Afrikander cattle or a stabilized Afrikander-Hereford cross (Kasaï breed) suit the local conditions best. Pure-bred Herefords rapidly show signs of deterioration. The methods which have been adopted to combat various insect vectors of disease are described. The greatest losses appear to be due to *Trypanosoma congolense.* A short review is given of other animal diseases encountered in this region. Contagious abortion was introduced by the first purchases from Rhodesia. Tuberculosis is very rare.—N. J. SCORGIE.

REINER, S. (1937). Veterinářský pruzkum. [**The Veterinary Service in Time of War**].—*Voj. Vet.* **6.** 36-45. [Numerous refs.] [English summary].

This deals with veterinary reconnaissance in war, its application, scope and uses. By veterinary reconnaissance R. understands – the examination of the topography, climatic conditions, sanitation, communications, the agricultural resources and the veterinary institutions of the invaded territory and the veterinary service of the opposing force.—E. PŘIBYL (BRNO).

I. FLÜCKIGER. (1937). La marque des animaux en police sanitaire. [**The Marking of Animals for Veterinary Police Purposes**].—*Bull. Off. internat. Epiz.* **14.** 223-244. Discussion pp. 446-455 and Resolution p. 480. 3 figs., 1 table.

II. MARCZEWISKI, M. (1937). La marque des animaux en police sanitaire. [**Marking of Animals for Veterinary Police Purposes**].—*Ibid.* 245-252. Discussion pp. 446-455 and Resolution p. 480.

After indicating commercial methods – which are applied voluntarily and cause no depreciation – both authors consider the sanitary police point of view where the marks become a nuisance and limit the economic use of the animals. [The discussion mainly concerns European conditions].

I. Gives reasons for marking (a) when animals are particularly susceptible to certain diseases, due to a change in domicile; (b) when necessary to prove that animals were healthy at a certain date; (c) when a control is necessary on the origin of animals that are relatively free in their movements; (d) to indicate that animals are more or less protected against certain diseases (preventative inoculation), and (e) when it is necessary to control animals capable of transmitting disease to receptive animals, that is by marking disease carriers or permanent excretors.

II. Discusses special marks as follows:–(A) "Marque d'identité (animal de commerce)" – individual identity mark and (B) "Marque de Foyer de Contagion" the latter being subdivided as follows:–

(a) "Marque préventive" – to prevent the export of animals from an infected area. To be used unofficially where the limits of the disease are not well defined.

(b) "Marque d'identité" – to prevent illicit movements within an affected area.

(c) "Marque dénonciatrice" – for infective animals.

The official denouncing mark must indicate the disease and, therefore, limits the utility of the animals. These denounced animals could be segregated, but slaughter is better than supervision.

The discussion brought out that no sanitary police measures exist without marks and without identification of animals. A permanent mark should give a national or international guarantee and should be applied without fear when necessary.

The Committee considered that the prophylaxis of certain contagious diseases cannot be dealt with efficiently unless carriers are submitted to sanitary control as well as diseased or in-contact animals. This control should be exercised as long as the carriers constitute a danger and it could assume a permanent character in certain circumstances. No supervision could be exercised unless the animals were properly marked for the duration of the control, and marking should be compulsory in certain cases.—A. H. HUNTER.

RAIBLE, J. (1937). Lumineszenz und ultraviolette Strahlen in der Milchhygiene. [**Luminescence and Ultra-Violet Light in Milk Hygiene**].—*Munch. tierärztl. Wschr.* **88.** 219-234, 242-244 and 268-271. [Numerous refs.]

Milk, after 15 minutes ultra-violet light treatment, develops a blue fluorescence. If the milk is tainted, as judged by external appearance, taste, reaction, sedimentation test or bacterial count, the fluorescence is not so characteristic. If milk is firstly given ultra-violet light treatment and hydrogen peroxide is then added a reaction similar to the catalase reaction takes place. R. suggests that good milk can be differentiated from bad by this test. This conclusion is based on the data obtained from over one hundred samples of milk which were also examined under the microscope as a confirmatory test, agreement being found in 90% of the samples.—JAMES STEWART.

I. DÉRIBÉRÉ, M. (1936). L'examen du lait de vache sous la lumière de Wood. [**Examination of Cows' Milk by Wood's Light**].—*Ann. Hyg. publ., Paris.* **14.** 168-170. [8 refs.]

II. TECCE, R. (1936). Essais sur l'emploi de la lumière de Wood dans la différenciation de quelques espèces microbiennes. [**Differentiation of Bacterial Species by Wood's Light**].—*Boll. Sez. ital. Soc. int. Microbiol.* **8.** 169-170. [In French].

III. Neseni, R. (1936). Luminiszenzerscheinungen am Blutserum unserer Haustiere. [**Luminescence of Animal Blood Sera**].—*Prag. tierärztl. Arch.* **16.** 169-174. 4 tables. [5 refs.]

I. Fresh milk fluoresces with a bright yellow colour. After standing for 20 hours the cream layer alone shines and the milk below becomes a dull white-blue shade. Boiled milk does not show this separation phenomenon ; but it loses its yellow for a blue fluorescence. Irradiated milk fluoresces blue. Milk containing streptococci shows a greenish tint in relation to normal milk. Watered and skimmed milk shows a less intense fluorescence than whole milk.

II. T. examined large loopfuls of bacterial suspensions placed on blotting paper under Wood's light and gives the following results for animal pathogens :- *Brucella abortus* fluoresced yellow-gray, *Br. melitensis* yellow to light chestnut, *Mycobact. tuberculosis*, bovine type, light cream, *M. tuberculosis*, human type, yellowish and *M. tuberculosis*, avian type, light pink.

III. Numerous samples of blood serum of healthy and diseased horses, cattle, sheep and swine were examined by Wood's light, but no significant results of diagnostic value were obtained. It is suggested that the amount of albumin present influences the colour.—J. E.

Nakagawa, T. (1936). Ueber die Durchgängigkeit der Plazenta für verschiedene Mikroorganismen und Bakteriophagen. [**On the Ability of Micro-Organisms and Bacteriophages to Pass through the Placenta**].—*Zlb. Bakt. I. (Orig.).* **136.** 147-151. [Copied *verbatim* from *Bull. Hyg., Lond.* **11.** 578. Signed P. H. Martin].

Various bacteria and bacteriophages were injected intravenously into healthy pregnant guineapigs and rabbits, and also into similar animals while under various experimental influences.

Pathogenic bacteria (Staphylococci, Streptococci, etc.) were found to pass comparatively quickly through the placenta. Histological damage could not always be found. Passage into the amniotic fluid appeared to be rather slower than into the foetus. High titre *coli* bacteriophage, and not typhoid or dysentery bacteriophage, was found to enter the foetus and amniotic fluid in healthy animals.

Under ether anasthesia entry of pathogenic bacteria was found markedly hastened and injection of placental extract or of antiplacental immune serum was followed by similar quick passage, which was somewhat slower after blockage of the reticulo-endothelial system.

The author believes that the placenta does not act only as a simple filter, but that a selectivity is exerted.

Liegeois, F., & Terache, P. (1937). Polypeptidémie normale et pathologique. Syndrome polypeptidotoxique. [**Polypeptides in Animal Physiology and Pathology**].—*Ann. Méd. vét.* **82.** 193-220. [Numerous refs.]

A description is given of the general physiology of the polypeptides (intermediate compounds in the breakdown of proteins to amino-acids) including their origin in the body and the normal blood and urine content. It was found impossible to produce an experimental hyperpolypeptidaemia by feeding large quantities of polypeptides, although the condition is very common in many pathological conditions. It is suggested that the physiological mechanism of the body to deal with the extra polypeptides in the blood consists of fixation of the extra amount in the tissues, elimination by the kidneys or transformation into urea by the liver. The authors were unable to substantiate the work of others who had suggested that there was a hyperpolypeptidaemia in cases of anaphylactic shock, during pregnancy,

in cases of general paralysis, intestinal obstruction or tuberculosis, but the number of cases examined was very small. In the case of dogs suffering from many different types of tumours no rise in the blood polypeptides was evident, which is contrary to the findings in man. It is shown that much of the toxic action following severe burns is accounted for by the presence of large amounts of polypeptides in the blood, which are at a maximum within 24 hours after the accident. Again in the case of traumatism following operations or accidents there is to be found a very severe hyperpolypeptidaemia which on the sixth day may rise as high as 284 mg.% compared with a normal of 21 mg.—JAMES STEWART.

OFFICIAL AND OTHER REPORTS.

INDIA. (1937). **Annual Report of the Imperial Council of Agricultural Research, for 1936-37.** pp. 119. 1 fig., 2 tables, 9 appendixes. New Delhi: Govt. India Press. [8vo] [Re.1. As.2]. [2s.]

The movement for the improvement of cattle in the provinces received a great impetus from the keen and practical interest taken in the matter by H. E. the Viceroy. A scheme was drawn up for establishing a central veterinary college at Izatnagar, in the United Provinces, for the teaching of Veterinary Science up to the standard required for the M.R.C.V.S. diploma. Sanction was obtained for the continuation of the Council's scheme for research in animal diseases in the provinces and for its extension to the Provinces of Orissa and Sind. It was decided to appoint a protozoologist at the Imperial Veterinary Research Institute, Muktesar. A scheme for intensive research into the life-history and bionomics of warble flies was started at the Imperial Veterinary Research Institute in January, 1937.—F. J. ANDREWS.

INDIA, BENGAL. (1937). **Annual Report of the Civil Veterinary Department** [KERR, P. J.] **and of the Bengal Veterinary College for the Year 1935-36.** pp. 70. 16 tables, 2 graphs, 9 appendixes.

(1) STAFF.—One additional veterinary assistant surgeon was added to the staff and sanction obtained for another.

(2) ANIMAL DISEASES.—The year was marked by very heavy losses from RINDERPEST, the losses reported (over 35,000), the number of outbreaks reported and number of inoculations performed being higher than ever before. It is claimed that the number of outbreaks promptly controlled by inoculations also created a record. Goat tissue vaccine was used in practically all outbreaks except in imported stock and in hill cattle. The serious increase in the incidence of the disease followed two years of excessive shortage of food, due to drought and floods. HAEMORRHAGIC SEPTICAEMIA showed a slight decrease, and BLACKLEG and ANTHRAX a considerable decrease, over the previous year. FOOT AND MOUTH DISEASE showed an increased incidence, with 790 deaths. Except for two districts, few cases of GLANDERS were found in the Province.

(3) PREVENTIVE INOCULATIONS.—670 cattle were given rinderpest serum, 150 serum and virus, and 368,000 goat tissue vaccine. 18,000 cattle were immunized against H. S., 5,500 against ANTHRAX and 1,000 against BLACKLEG.

(4) SPECIAL INVESTIGATIONS.—Work was carried out on the effect of goat tissue vaccine on milch cows and pregnant cows. Investigation of HAEMATURIA of cattle and FILIARIASIS continued.

(5) HOSPITALS AND DISPENSARIES.—126,000 animals were treated at the hospitals and dispensaries, and 111,000 on tour. Over 5,000 scrub bulls were castrated.

(6) EDUCATION. REPORT OF THE BENGAL VETERINARY COLLEGE. [MCGREGOR, A. D.]—174 students were under instruction during the year and 42 passed their final (third year) examination. 2,250 patients were admitted to the hospital.

In the Calcutta area there were 6 outbreaks of GLANDERS in which nine animals died or were destroyed. There were 18 outbreaks of F. & M. DISEASE and 35 of RINDERPEST. 1,800 cattle received rinderpest serum or goat tissue vaccine.—F. J. ANDREWS.

I. INDIA, BOMBAY. (1937). **Annual Administration Report of the Civil Veterinary Department, for the Year 1935-36.** [FARBROTHER, E. S.]—*Rep. vet. Coll. civ. vet. Dep. Bombay, 1935-1936.* pp. 1-10. 2 tables.

II. INDIA, BOMBAY. (1937). **Annual Administration Report of the City and Harbour Veterinary Department for the Year, 1935-36.** [PHADKE, V. R.]—*Ibid.* pp. 11-12.

III. INDIA, SIND. (1937). **Annual Administration Report of the Civil Veterinary Department for the Year 1935-36.** [JERROM, J. H. G.]—*Ibid.* pp. 35-39.

I & II. STAFF.—Seven additional appointments were sanctioned.

ANIMAL DISEASES.—No case of GLANDERS was detected. SURRA was detected in 40 horses; 28 of these received "naganol", but only 11 recovered. 23,000 cases of RINDERPEST were reported, with 12,000 deaths – a considerable increase over the previous year. There were 1,100 outbreaks of FOOT AND MOUTH DISEASE, about half those of the previous year. HAEMORRHAGIC SEPTICAEMIA showed a decrease, but there were 5,300 deaths. There was a slight increase in BLACKLEG, and ANTHRAX was fairly wide-spread. A few cases of SURRA in cattle were reported. Diseases of poultry are receiving more and more attention. 1,200 deaths from NEWCASTLE DISEASE were reported, and 1,000 from FOWL CHOLERA.

PREVENTIVE INOCULATIONS.—The preparation of rinderpest tissue vaccine was started at the Bombay Veterinary College in July, and was used to control outbreaks in some areas but the use of goat tissue vaccine has now been made general throughout the province. 37,000 cattle received serum and 52,000 vaccine. 4,300 cattle were immunized against H.S. before the onset of the season, and 26,700 received serum during outbreaks. 15,700 were vaccinated against BLACKLEG, and 450 animals received ANTHRAX serum in 8 outbreaks.

HOSPITALS AND DISPENSARIES.—At the 112 hospitals and dispensaries, 250,000 animals were treated and 22,000 castrated, and in villages, 55,000 were treated and 10,000 castrated.

EDUCATION.—103 students attended classes at the Bombay Veterinary College during the year, and 13 passed the final (third year) examination. Clinical instruction was received at the Bai Sakarbai Dinshaw Petit Hospital, where 2,350 in-patients and 1,900 out-patients were treated.

III. The subordinate staff consisted of one veterinary inspector and 23 veterinary assistant surgeons, one of whom was specially appointed for work on goat-tissue vaccine.

ANIMAL DISEASES.—61 cases of surra were detected in horses, with 14 deaths; the rest were treated with "naganol".

In 51 outbreaks of RINDERPEST there were 940 deaths, and 880 deaths in 123 outbreaks of H.S. 104 outbreaks of FOOT AND MOUTH DISEASE were reported, and one single case of ANTHRAX.

PREVENTIVE INOCULATION.—Rinderpest serum was given in 21 outbreaks to 1,000 cattle, and goat tissue vaccine to 1,100 in 8 outbreaks. In 23 outbreaks of H.S., serum was given to 1,600 cattle.

HOSPITALS AND DISPENSARIES.—In 19 dispensaries, 28,000 animals were treated and 2,300 castrated, while 9,700 were treated and 1,200 castrated on tour.
—F. J. ANDREWS.

INDIA, BALUCHISTAN. (1937). **Administration Report of the Baluchistan Agency for the Year 1st April 1935 to 31st March 1936.** pp. 144. 13 tables. Numerous appendixes. New Delhi: Govt. India Press. [8vo] [Rs.2.As.14] [5s.]

All the information given regarding veterinary work in the province is contained in a number of tables.

STAFF.—12 veterinary assistants were employed.

ANIMAL DISEASES.—No RINDERPEST occurred during the year, but 360 cattle died of BLACKLEG. In 8 outbreaks of ANTHRAX, there were no less than 1,100 deaths among animals other than equines and bovines. There were 32,000 cases of GOAT and SHEEP MANGE, with 900 deaths.

PREVENTIVE INOCULATIONS.—In 15 outbreaks of blackleg, serum was given to 1,000 cattle.

DISPENSARIES.—29,700 animals were treated at the 10 dispensaries, and 260 were castrated; and on tour 50,000 were treated and 13 castrated.—F. J. ANDREWS.

TANGANYIKA TERRITORY. (1937). **Annual Report of the Department of Veterinary Science and Animal Husbandry 1936.** [HORNBY, H. E.] pp. 55. 6 tables. Dar-es-Salaam: Govt. Printer. [fcp] [Shs.2/50]. [2s. 6d.]

This report has been deliberately curtailed in an endeavour to expedite its issue as previous reports have been coming out later and later each year; it is the Director's hope that subsequent reports will hereinafter return to the format of the 1930-35 series and be published earlier than has been the case in the past.

ADMINISTRATION.—Mr. H. J. LOWE, acted as Director during the absence on leave of Mr. H. E. HORNBY. An arrangement was made, at the request of the Government of Basutoland, for a botanist to be seconded for a few months each year to advise on and otherwise assist in anti-soil erosion measures. Reorganization of the native staff was continued and their classification into grades etc. was completed. A class of native veterinary assistants, who had previously passed standard VIII in general education in government schools, were instructed in (a) elementary anatomy and physiology, and (b) the common diseases of domestic animals. Gratifying aptitude and keenness were evinced and the experiment is continuing.

DISEASE CONTROL.—RINDERPEST. In spite of the most strenuous and continued efforts, on the part of the small field staff, the disease was slowly spreading and at the end of the year had entered the Central Province and was passing southwards over a hundred mile front. Game animals undoubtedly played no small part in spreading the disease during 1936. The general remarks which appeared in the previous report on CONTAGIOUS BOVINE PLEURO-PNEUMONIA still apply. No feasible or efficient policy for its eradication has yet been formulated.

A few privately owned dipping tanks were erected by European farmers, who now realize that progressive cattle husbandry in the presence of EAST COAST FEVER is not feasible. The complexity of the problem in the great native areas where the disease is enzootic is discussed.

Apart from EAST COAST FEVER, TICK-BORNE DISEASES were not responsible for any serious mortality in ruminants.

TRYPANOSOMIASIS AND TSETSE FLY. Very serious and important advances of "fly" are occurring in the Central and Southern Highlands' provinces and schemes have been formulated by the Director of Tsetse Research for stopping further

spread. Of the major schemes for reclamation already under trial, two are discussed as of outstanding interest. The function of the Veterinary Department in these schemes is the important one of introducing stock into the settlements, many of which are entirely surrounded by thick " fly ", and then assisting further, not only with their maintenance, but with their correct utilization. It is intended to open a small departmental farm in one of the major settlements for the study of this particular stocking problem under these special circumstances.

ANTHRAX, BLACKLEG, TUBERCULOSIS, FOOT AND MOUTH DISEASE, BOVINE CONTAGIOUS ABORTION, RABIES, HELMINTHIASIS, etc. are recognized and their distribution and significance discussed briefly, and there are short notes on diseases of equines, pigs, dogs, cats and poultry.

A valuable report was received from the Hides and Skins Committee of the Imperial Institute on a parcel of goat skins affected in varying degree with SARCOPTIC MANGE. From this it would appear that a skin affected with active lesions is useless for leather production, whilst the skin of a goat which has recovered from generalized infection will yield a coarse but saleable leather.

MEAT INSPECTION.—The results of the inspection of 16,577 oxen, 26,405 sheep and goats and 664 pigs are briefly reviewed. The main causes of condemnation were as heretofore – *Cysticercus bovis* in cattle and *C. cellulosae* in pigs.

FINANCE.—The total expenditure amounted to £42,290 and revenue, potential and actual (potential – a nominal value of biological products issued free to both European and native stockowners), is shown as £17,068.—S. A. EVANS.

TANGANYIKA TERRITORY. (1937). **Report on the Work of the Mpwapwa Laboratory, and Some Research Notes.** [CORNELL, R. L.]—*Rep. Dep. vet. Sci. Tanganyika, 1936.* pp. 16-30.

ROUTINE.—ANTI-RINDERPEST SERUM AND VACCINE PRODUCTION. Field issues amounted to 154,157 doses of serum (unit 40 c.c.) and 39,110 doses of vaccine (unit 10 c.c.). The serum issue constituted a record output. Production was seriously handicapped by intercurrent trypanosomiasis.

MORBID SPECIMENS. 4,649 slides and specimens were received, from outside sources, for examination and report. This was an increase of 1,158 over the previous year.

RESEARCH NOTES.—RINDERPEST. (1) EFFECT OF TARTAR EMETIC INJECTIONS FOR TREATMENT OF TRYPANOSOMIASIS DURING A RINDERPEST REACTION. It would appear from observations on six oxen that animals with fever and commencing rinderpest are not able to stand the toxic effects of the usual dose of the antimony salt.

(2) EXPERIMENT ON THE INFECTIVITY OF ANIMALS UNDERGOING DOUBLE-INOCULATION. The experiment suggests that it is possible for double-inoculated cattle to spread infection by contact for three days following inoculation.

(3) ABSENCE OF VIRUS FROM A GOAT FOETUS ABORTED 32 DAYS AFTER INOCULATION OF THE DAM WITH RINDERPEST. This observation was recorded in connexion with earlier experiments of JACOTOT who demonstrated virus in abortions and discharges of cows for as long as six weeks after infection.

(4) ATTEMPTS TO ATTENUATE RINDERPEST VIRUS BY PASSAGE THROUGH GOATS. With a view to a possible short cut in attenuation, some of the goats were vaccinated prior to inoculation with virus, the underlying idea being that attenuation might be related to the resistance of the host. The data (13 passages recorded), showed that passage of the virus through vaccinated goats did not apparently accelerate attenuation in a short series.

(5) PRESERVATION OF SERUM. Formalin was tried instead of the routine

0·5% carbolic acid; the appearance of the final product was improved but the serious disadvantage was that many samples of serum gelled solidly. A modification adopted as of practical value, was the addition of boric acid to the bleeding jars.

(6) YIELD OF SERUM WITH DIFFERENT CONTAINERS. Glass containers undoubtedly possessed advantages over metal containers (the latter being treated by various lubricants to facilitate the separation of the clot), both in the yield obtained and in the appearance of the serum. Breakages can be obviated by enclosing the glass jars in suitable wooden cases.

(7) IMPROVED METHODS OF HYPERIMMUNIZATION. Several recognized methods of hyperimmunization, in vogue elsewhere, were tried out again, as the local intra-ruminal method, though more humane, does not produce such uniformly high titre serum. Analyses of several brews of serum, produced by different methods, were carried out by the chemist and it was concluded that there was no apparent direct relationship between the percentage of euglobulin and potency.

A routine method of dosing donkeys for the control of worms (oleum chenopodium 5 c.c., oleum terebenthine 15 c.c., oleum lini 250 c.c.) is recommended as an economic and efficient worm expellent. The above dose is for adults and half this quantity is used for yearlings. A male horse catheter makes a most efficient stomach tube for the donkey.

An interesting account is given of an outbreak of TETANUS in some herds which had been vaccinated with anti-rinderpest vaccine. The mortality was almost entirely confined to young calves, indicating that a serviceable immunity is acquired comparatively early in life. The most disquieting feature of the outbreak was the difficulty in deciding on a really reliable laboratory test to protect against similar accidents in the future. The method of preparation of the vaccine is given in detail and the possible source or means of entry of the infective organism is discussed.—S. A. EVANS.

GERMANY. (1937). Die Verbreitung von Tierseuchen und die Ergebnisse der Schlachtvieh- und Fleischbeschau im Jahre 1934. [**Germany: Animal Diseases and Abattoir Returns for Germany in 1934**]. pp. 119. Numerous tables and graphs. Berlin: Paul Schmidt. [fcp] [RM.6.50].

The report deals with notifiable diseases and with abattoir traffic and meat inspection. It consists largely of tables the data of which are discussed with reference to territorial incidence, means of diagnosis, control measures etc. Notifiable diseases not observed included DOURINE, RINDERPEST and CONTAGIOUS BOVINE PLEURO-PNEUMONIA. The following were observed in at least one part of the Reich :– STRANGLES, ANTHRAX, TUBERCULOSIS, GLANDERS, SWINE ERYSIPELAS, HAEMORRHAGIC SEPTICAEMIA (including "swine plague" and fowl cholera), BLACKLEG, FOOT AND MOUTH DISEASE, BORNA DISEASE, EQUINE INFECTIOUS ANAEMIA, GENITAL VESICULAR EXANTHEMA, SHEEP POX, SWINE FEVER, RABIES, FOWL PLAGUE, MANGE and SHEEP SCAB, VAGINAL CATARRH and bee diseases.

The original must be seen for details.—J. E.

FRANCE. (1937). Rapport sur les opérations du service vétérinaire sanitaire de Paris et du département de la Seine pendant l'année 1936. [**Report of the Veterinary Services of Paris and the Department of the Seine, 1936**]. [CHRÉTIEN, A.] pp. 182. 2 figs., numerous tables, 3 graphs. [Numerous refs.] Paris: Imprimerie Chaix. [4to].

This report is most exhaustive in detail and this no doubt accounts for the delay in its issue.

Live Animals in the Seine Department.—There were 12,370 horses, 18 mules, 41 asses, 11 bulls, 3,642 cows, 30 calves, 25 sheep, 60 goats and 5,194 pigs, making a total of 21,391. The majority of the pigs are fed on swill from hotels and restaurants.

Contagious Diseases.—The number of dogs licensed was 202,162 and rabies occurred in 2 dogs and 1 cat.

No cases of Anthrax, Blackleg, Sheep Scab, Foot and Mouth Disease, or Glanders were observed.

Abattoirs.—In addition to the large abattoirs at La Villette and Vaugirard, there are eight other slaughtering places in the Department of the Seine. The number of animals killed and inspected was 363,721 cattle, 289,256 calves, 1,108,004 sheep and goats, 792,715 pigs, and 71,046 horses.

Imported Meats.—138,998,311 kg. were inspected.

Knackeries.—Three knackeries exist; 7,651 animals of various kinds were dealt with and one case of anthrax, 68 of tuberculosis and 19 of pneumo-enteritis were encountered.

Consumption of Meat.—There are 5,000,000 inhabitants in Paris and they require 200,000 tons of meat annually, the majority being home produce.

Carcasses Unfit for Food.

Cause of surrender.	*Cattle.*	*Sheep.*	*Pigs.*	*Horses.*
Tuberculosis	4,325	1	4,975	8
Other diseases	8,664	3,592	6,750	1,060
Total	12,989	3,593	11,725	1,068

Amongst the animals imported into the Department there were discovered 66 cases of Foot and Mouth Disease, 136 sheep affected with Scab, 175 pigs with Swine Fever, and 40 lambs with *Brucella melitensis* infection; 1,225 bovines suspected to be affected with TB. were isolatd and examined; in 33 the infection was generalized and in 42 localized; 200 animals were found affected with Actinomycosis. The number of cases of Johne's Disease is not given although cases were observed.

Laboratory Diagnosis.—A considerable amount of research work has been done on icterus in sheep due to anaplasmosis, tumours, TB., softening of bone-marrow and acetone in muscular tissue, etc.—T. Dunlop Young.

Eritrea. (1937). Istituto Siero Vaccinogeno Eritreo. Relazione sull'attività svolta dall'istituto durante l'anno 1935-1936. [**Eritrea: Report of the Serum and Vaccine Institute for 1935-1936**]. [Cilli, V.]—*Nuova Vet.* **15.** 147-161. 2 text figs., 6 figs. on 1 plate, 6 tables.

C. stresses the importance of the Institute; government support has enabled them to increase to a thousand the "herd" used for manufacturing serum and vaccine, and to erect a new building for storage.

The work of the Institution is reviewed under various heads. (1). Rinderpest – over 44,000 animals were treated in the field, but the immunity acquired after the use of vaccine was of only $1\frac{1}{2}$-$5\frac{1}{2}$ months' duration. Simultaneous serum-virus inoculation is said to be the only method suitable to a country in which cattle migrate in search of pasture and water. (2). A large increase is reported in the production of smallpox vaccine. (3). Antirabies vaccine is prepared for men and beasts. There has been systematic slaughter of suspected dogs. Prophylactic vaccination was used and was believed to be effective. (4). Anti-streptococcus serum is prepared. (5). Anti-tetanus serum is prepared for human and veterinary

use. (6). Vaccine is prepared against AFRICAN HORSE-SICKNESS. Over 5,000 horses were immunized. Reports are not complete and experiments still continue, but doubt is expressed if immunity is conferred for longer than two months. Experiments on guinea pigs and rats are described and illustrated by photographs. (7). Brief notes are given on work done in testing milk and on reports on various subjects submitted to the laboratory for examination.—S. F. J. HODGMAN.

I. UNITED STATES OF AMERICA. NEW YORK. (1936). **Report of the New York State Veterinary College at Cornell University for the Year 1934-1935.** [HAGAN, W. A.] pp. 157. 16 figs. on 11 plates, 20 tables. [Numerous refs.] Albany: J. B. Lyon Company. [8vo].

II. UNITED STATES OF AMERICA. NEW YORK. (1937). **Report of the New York State Veterinary College at Cornell University for the Year 1935-36.** [HAGAN, W. A.] pp. 174. Numerous figs., plates, tables. [Numerous refs.] Albany: J. B. Lyon Co. [8vo].

I. The number of students was limited as a matter of policy, only 37 out of 116 new candidates for admission being accepted, bringing the total to 160. Additional funds were provided for work on POULTRY DISEASES and two research workers were appointed, one to study PARASITOLOGY and the other NEUROLYMPHOMATOSIS.

The usual departmental reports are given. In the course of diagnostic work done at the Poultry Disease Laboratory at Farmingdale, the following items are noteworthy:—*Pfeiferella anatipestifer* infection killed off the greater part of a flock of semi-wild black ducks within a period of one week. FOWL CHOLERA caused heavy losses on some duck farms. Three outbreaks of *Salmonella anatum* infection in young ducklings are reported. Dilute PULLORUM DISEASE antigen was found to have retained its specific qualities for periods up to 8 years after storage at 5°-8°C. The bulk of the report is made up of reprints of research and clinical articles which have already been published.

II. The student strength was limited to 150, at which figure it is intended to keep it in future. The report is on the same lines as the previous one. Fresh items of interest from the Farmingdale laboratory include the discovery of *Pasteurella avicida* in the heart blood of three starlings found dead, and the same infection in ducks while *Pf. anatipestifer* and *S. anatum* were also discovered in ducks.—J. E.

I. LECLAINCHE, E. (1937). Rapport administratif du Directeur de l'Office pour l'année 1936-1937. [**Report of the Director of the Office International des Epizooties for 1936-1937**].—*Bull. Off. internat. Epiz.* **14.** 362-365.

II. LECLAINCHE, E. (1937). La situation sanitaire en 1936. [**The Animal Disease Situation in Europe in 1936**].—*Ibid.* 5-19. 1 table, 2 graphs, 2 maps.

I. L. gives notes on the information sent by co-operating countries to the Office and renews his plea for regular and standardized reports from every country.

During 1936 the Office provided 30,000 gold francs for special research, reports on which are published in this volume. The grants were given to the Foot and Mouth Disease institutes at Riems, Lindholm, Rotterdam and Gorodomlia (? Russia); to Dr. MIRRI, Palermo (contagious agalactia); to Dr. TODOROFF, Stara Zagora (swine fever); and to the Ambulatory Clinic of Berne veterinary school (tuberculin tests).

The committee of the Office is discussing ways to standardize tuberculin.

II. A review of the individual reports supplied by the supporting countries, dealing with 13 important infectious diseases. Being already condensed it cannot be abstracted.—J. E.

BOOK REVIEWS.

ANON. (1937). **Perspectives in Biochemistry. Thirty-One Essays Presented to Sir Frederick Gowland Hopkins by Past and Present Members of his Laboratory.** pp. viii + 361. Numerous figs., plates and tables, 2 graphs. [Numerous refs.] [Edited by NEEDHAM, J., & GREEN, D. E.] London : Cambridge University Press. [8vo] [15s.]

This volume makes fascinating reading for all interested in the science of life. Biochemists worthy of the name will buy it for their private shelves, apart from their access to it in libraries. The 31 essays were written to commemorate the 75th birthday of Sir Frederick GOWLAND HOPKINS by writers who owe much of their own success in life to his teaching. They touch upon biochemistry in its relation to pure chemistry, to physiology, zoology, embryology, bacteriology, nutrition, genetics, medicine and human welfare.

Representative titles so diverse as " The Biochemistry of the Individual " (J. B. S. HALDANE), " The Biochemistry of Flower Colour Variations " (R. SCOTT-MONCRIEFF), " Molecular Forces, Orientation and Surface Films " (N. K. ADAM), " Vitamin C and Infection " (L. J. HARRIS), " The Social Implications of Biochemistry " (J. MARRACK), " The Chemical Regulation of Insect Growth " (V. B. WIGGLESWORTH), " Biochemistry and Mental Disorder " (J. H. QUASTEL), " The Economy of the Bacterial Cell " (M. STEPHENSON), " The Meaninglessness of the Terms Life and Living " (N. W. PIRIE), " Rigidification in Phylogeny " (E. BALDWIN), and " Drugs and Mankind " (A. J. CLARK), serve to show the nature of the book.

The aim of the 31 writers has been to indicate the most promising lines of advance in the fields they survey, speculating freely on the likely paths of future thought without sacrifice of critical outlook.—H. H. GREEN.

LAPAGE, G. [M.A., M.D. Institute of Animal Pathology, University of Cambridge]. (1937). **Nematodes Parasitic in Animals.** pp. x + 172 + 8. [Numerous refs.] London : Methuen & Co., Ltd. [8vo].

L. has made a worthy contribution to this now famous series of monographs. He divides his book into four chapters which deal with :- (1) structure, life-histories and classification ; (2) physiology ; (3) the resistance of the host to nematode infestations, and (4) the control of nematode infestations. In addition, there is an excellent bibliography. The aim of these monographs is to survey the most important and recent work on the subjects with which they deal ; it is therefore difficult to preserve, within their small compass, a proper balance between the respective sections, and in these days of experimental approach to a subject it is not surprising that the chapter on the physiology of nematodes far outstrips the others in the matter of length. L. says (in his introduction) that " It is a pity that space is not available for an adequate account of the considerable and important recent additions to knowledge of the structure and life-histories of parasitic nematodes ". We heartily endorse this statement and, in doing so, we hope that he will see his way clear to publishing another volume devoted to this aspect of the subject which will be as readable and authoritative as this.—C. HORTON-SMITH.

WEBER, E. [O. Professor und Direktor der ambulatorischen Tierklinik an der Universität Leipzig]. (1937). Die Krankheiten des Rindes. **[The Diseases of Cattle].** pp. x + 562. 81 text figs., 7 figs. on 3 plates. [Numerous refs.] Berlin : Richard Schoetz. [2nd Edit.] [4to] [RM.20.60].

Since 1927, the date of the small first edition, the author has been collecting

new material and over 200 new subject items appear in this second edition, which is more than twice as large as the first. As a result the book may now be said to be a complete treatise on the diseases of cattle in Germany and other countries in the temperate zone.

The subject matter is arranged according to body systems and organs and includes infectious and parasitic diseases along with the more numerous sporadic conditions to which the book is mainly devoted. The lay-out is very concise and a few references to published papers on the various conditions are given.

Diagnosis is only dealt with very briefly, because it has been made the subject of another book by the same author [(1928). Die klinische Untersuchung des Rindes. Berlin: Richard Schoetz]. So, whilst the present book under review is recommended to veterinary students and cattle practitioners, it is worth while to draw attention to the companion volume.—J. E.

MENSA, A. (1937). [Direttore dell'Instituto di Chirurgia Veterinaria della R. Universitä di Bologna]. Patologia chirurgica veterinaria. [**Surgical Veterinary Pathology**]. pp. xx + 796. Numerous figs., 2 tables. [Numerous refs.] Turin: Unione Tipografico Editrice Torinese. [8vo]. [L.90].

Defining surgery as a " branch of medicine which studies and cures external and internal diseases susceptible to therapeutic intervention with a local action . . ." M. has taken a very wide field for his work with full regard to infectious and parasitic diseases as well as to surgical diseases in the ordinary sense. He has produced an admirable book worthy to rank among the best veterinary text-books of any country.

The book is in two main parts – general and systematic, the former occupying about six-sevenths of the whole, but in reality it contains such a wealth of illustration in the form of special cases described in words and figures, that there seems little advantage in differentiating the material in this way.

Every term and condition in surgical pathology is carefully defined and described, so that students knowing nothing of the subject can learn from it and need not look elsewhere, *e.g.*, in medical books as is necessary in Great Britain.

M. shows himself to be very well read in international veterinary literature and he has adopted the practice of inserting special reference lists throughout, and gives a list of text-books he has consulted. It appears noteworthy to mention that war gases have not been overlooked, there being a section on their properties and action on domestic animals.

The figures are to a large extent borrowed from other authors and vary in clarity, some being rather poor; a few are in colour. The index is quite lavish, the printing excellent and the binding fairly strong. A second companion volume on, evidently, general and regional surgery, is to be published in the future.—J. E.

SICÉ, A. [Médecin du Corps de Santé Colonial, Ancien Directeur de l'Institut Pasteur de l'A.E.F.]. (1937). La trypanosomiase humaine en Afrique intertropicale. [**Human Trypanosomiasis in Africa**]. pp. xi + 306. 43 figs., 4 plates, 1 map. [Numerous refs.] Paris: Vigot Frerès. [8vo] [Fr.50].

This book gives a very complete picture of human trypanosomiasis in Africa. It is divided into five chapters dealing with the distribution of the disease, its epidemiology, symptomatology, treatment and prevention of infection. The sections of comparative interest are those dealing with epidemiology, treatment and prevention. The author emphasizes the importance of mechanical transmission, whether by tsetse or other flies, in human epidemics, and the fact that

human infection is mainly due to transmission of trypanosomes by tsetse from man to man, animals tending to protect man in that they divert the tsetse from him. Although, in the main this may be correct, there is evidence that strains infective to man may survive in animals. The effect of such strains on animals, the circumstances in which they may become of importance, and the influence of domestic animals on attracting tsetse flies into human settlement, do not appear to have been fully considered. Under the section on prophylactic measures, the eradication of the various species of tsetse flies is very fully discussed, and it is considered that game destruction is not an effective measure, even in the case of *Glossina morsitans*. The book can be recommended to those interested in the subject.—U. F. RICHARDSON.

ZEISS, H. [Prof. f. Hygiene Universität Berlin], & RODENWALDT, E. [Prof. f. Hygiene Universität Heidelberg]. (1937). Einführung in die Hygiene und Seuchenlehre. [**An Introduction to Hygiene and Infectious Diseases**]. pp. viii + 282. 1 fig., 12 tables, 1 chart. [Numerous refs.] Stuttgart: Ferdinand Enke. [2nd Edit.] [8vo] [RM.9.40].

This is a text-book of human medical hygiene in which special reference is made to infectious diseases. Included are chapters on the part played by food, water, sewage, industry, disinfection and disinfestation upon the general standard of health. Finally there is a chapter in which the correlation between the geographical situation of a country and its important endemic human diseases is explained.

In the second portion of the book various transmissible diseases of mankind are discussed, this section being preceded by a discussion of the systematic bacteriology and diagnosis of infectious diseases. An attempt has been made to give a comprehensive description of the identification of bacteria in a clinical pathological laboratory, but the space allotted for this purpose is too small and the authors have been unable to indicate clearly the laboratory procedures which are essential for the recognition of various diseases. There follow brief descriptions of various infectious conditions treated from the point of view of distribution, history, diagnosis, prevention and treatment.

Whilst this publication is an interesting and well-meant attempt to join up the subjects of hygiene and preventive medicine, in the opinion of the reviewer too little space has been devoted to the vital connecting link, epidemiology, and much of the value of the work has thereby been lost. [It is not primarily of veterinary interest, but is of value for anyone wishing to refer to certain animal diseases which also occur in man].—E. J. PULLINGER.

NEIPP, L. [Docteur ès Sciences, Pharmacien, Ancien Moniteur de Bactériologie à la Faculté de Paris]. (1937). De l'influence de divers cations sur le croît microbien. [**The Influence of Cations on Bacterial Growth**]. pp. 430. Numerous figs., tables, graphs. [Numerous refs.] Paris: Masson et Cie. [8vo] [Fr.90].

In this book, N. has assembled the results of his studies on the influence of certain ions in various concentrations upon bacterial growth, giving at the same time a comprehensive survey of relevant literature. Further, he has tried to correlate the various effects observed with possible variations of the electrical charges possessed by the bacteria.

The work is divided into three sections. The first part consists of descriptions of the general technique adopted in such studies, with a detailed account of the

technique employed in the present work. This part also contains a general perspective of the knowledge of bacterial multiplication. The second section comprises an exhaustive review of the literature dealing with the influence of the ions of lanthanum, cerium, lead, mercury and silver on the promotion of bacterial growth and of the Arndt-Schultz law as interpreted by various authors. Included here also are N's own experiments on the effect of various concentrations of the above-mentioned ions on the growth of *Pseudomonas pyocyanea* and the results obtained are expressed in the form of numerous tables and graphs. These results are further discussed according to whether the varying concentrations of the various ions employed were inhibitory, stimulatory or without effect upon the growth and development of the organism in question. The third part deals with the effects of these ions on the electrical charges of the bacteria, employing the methods of electrophoresis; N. concludes that the stimulation or inhibition of bacterial growth does not seem to be attributable to variations in the electrification of the bacteria. The book concludes with a concise summary of the author's experimental studies together with a very full and comprehensive bibliography.

The subject matter is generally of a highly specialized nature and must at present be regarded as being more of interest to the purely academic bacteriologist rather than of immediate practical value.—ALFRED EDEN.

SOUTHWELL, T. [D.Sc., Ph.D., A.R.C.Sc., F.Z.S., F.R.S.E., Walter Myers Lecturer in Parasitology, School of Tropical Medicine, University of Liverpool], & KIRSHNER, A. [M.B., Ch.B. (Capetown), D.T.M. (Liverpool), F.Z.S., Assistant Lecturer in Parasitology, School of Tropical Medicine, University of Liverpool]. (1937). **A Guide to Veterinary Parasitology for Veterinary Students and Practitioners.** pp. x + 143. 88 figs., 11 tables, 12 diagrams. [4 refs.] London: H. K. Lewis & Co., Ltd. [8vo] [7s. 6d.]

Thisbook should prove a valuable aid to those engaged in parasitological work. The concise text, embellished by a profusion of clear figures, will much reduce the labour of identifying the adult and larval stages, and eggs of parasites. The parasites of domestic animals are naturally the chief concern of the authors, but as these parasites form a representative collection one feels that "A Guide to Veterinary Parasitology" will make an appeal to students of parasitological problems from other standpoints. On page 18 "*Eimeria avium*" is noted as a parasite under "Birds (including poultry)"; this is out-of-date nomenclature since recent work has established the presence of at least six species of *Eimeriae* in domestic fowls alone and these appear to be host-specific. *E. avium* is synonymous with *E. tenella*. Again on p. 19 under "Diagnosis" we read that "Coccidiosis in chickens, rabbits and other animals can be diagnosed *definitely* [the italics are mine – C. H.-S.] by finding oocysts in the faeces". We do not know whether the authors mean the disease "coccidiosis" or merely the presence of coccidia, but the passing of oocysts is certainly no criterion for assuming the presence of disease. Referring to oocysts, some statement should have been made on the numberless plate occupying pp. 124-125 to explain the inclusion of a coccidial oocyst among helminth eggs; its presence is of value in illustrating the relative sizes of the eggs of different parasites that are likely to be met with in the examination of faecal smears, etc. Reference numbers 4 and 5 on figure 34 which relate to vas deferens and cirrus pouch are omitted, but such minor criticisms are quite overshadowed by the merits of the book.—C. HORTON-SMITH.